Ioan-Iustin Vadana

INTERNATIONALIZATION OF BORN-DIGITAL COMPANIES

ACTA UNIVERSITATIS LAPPEENRANTAENSIS 926

Ioan-Iustin Vadana

INTERNATIONALIZATION OF BORN-DIGITAL COMPANIES

Dissertation for the degree of Doctor of Science (Economics and Business Administration) to be presented online with due permission for public examination and criticism on the 20th of November, 2020, at 3 pm.

Acta Universitatis
Lappeenrantaensis 926

Supervisors Professor Olli Kuivalainen
LUT School of Business and Management
Lappeenranta-Lahti University of Technology LUT
Finland

Professor Sami Saarenketo
LUT School of Business and Management
Lappeenranta-Lahti University of Technology LUT
Finland

Associate Professor Lasse Torkkeli
LUT School of Business and Management
Lappeenranta-Lahti University of Technology LUT
Finland

Reviewers Professor Tamer S. Cavusgil
Robinson College of Business
Georgia State University
US

Professor Arto Ojala
School of Marketing and Communication
University of Vaasa
Finland

Opponents Professor Tamer S. Cavusgil
Robinson College of Business
Georgia State University
US

Professor Arto Ojala
School of Marketing and Communication
University of Vaasa
Finland

ISBN 978-952-335-570-5
ISBN 978-952-335-571-2 (PDF)
ISSN-L 1456-4491
ISSN 1456-4491

Lappeenranta-Lahti University of Technology LUT
LUT University Press 2020

Abstract

Ioan-Iustin Vadana
Internationalization of born-digital companies

Lappeenranta 2020
90 pages

Acta Universitatis Lappeenrantaensis 926
Diss. Lappeenranta-Lahti University of Technology LUT
ISBN 978-952-335-570-5, ISBN 978-952-335-571-2 (PDF), ISSN-L 1456-4491, ISSN 1456-4491

This dissertation addresses the digitalization of the value-chain activities of companies and its impact on the internationalization strategy and international performance of these companies. Literature provides an incomplete image of how value-chain digitalization (upstream and downstream) activities influences the internationalization of companies (both strategy and performance) and provides no understanding regarding the impact of the digitalization degree of the value-chain on the level of internationalization. In addition, most of the research focuses particularly on the downstream activities of the value-chain when analyzing company internationalization, neglecting the upstream aspect; even fewer these papers approach both aspects in relation to internationalization strategy and international performance.

This thesis contributes to the international business literature, international entrepreneurship and international marketing, first, by providing ways to classify international born-digital and digitalized/digitizing companies according to the extent of digitalization of their value-chain activities and the extent of internationalization of the online–offline geographical dispersion of value-chain activities in foreign markets. Second, by extending the discussion on the behavior of BD companies as they strategically approach internationalization efforts, the implications of digitalized value-chain activities (both upstream and downstream) on the international performance of BD companies are discussed. Third, the thesis reveals that BD companies may be expanding their international presence, particularly based on their digitalized upstream value-chain activities, and that in certain cases, there may be an increasing number of performance consequences.

By targeting digitalization of both upstream and downstream processes of the value-chain activities, managers can identify business strategies to expand the potential role of internationalization and improve their company performance.

Keywords: digitalization, born-digital, web, mobile technologies, value-chain, internationalization, international marketing, internationalization strategy, international performance

Acknowledgement

I had an insightful academic and entrepreneurial adventure during the master program in science and business administration especially thanks to Rico Baldegger, Patrick Schueffel and Philipp Bubenzer, at School of Management Fribourg, and it felt natural to continue with a doctorate program in international business. School of Business and Management, at LUT University, in Finland, seemed at that time a winning choice because of its top record in international business research. And now, at the end of this road, I can confirm that LUT is one of the best places where one can meet best researchers, and get and practice entrepreneurship skills, through learning and interacting with academic community and business environment.

However, this dissertation would never exist especially without the Olli Kuivalainen, who after two online friendly discussions, decided that I'm fit to be a part of the international entrepreneurship research team of the School of Business and Management. He actually gave me opportunity to experience the academic life.

Since then, my supervisors and co-authors of my article-based dissertation, Olli Kuivalainen, Sami Saarenketo and Lasse Torkkeli, they nurtured our collaboration by supporting, motivating and pushing me always to reach and exceed my potential. I am totally thankful for their patience in guiding me through all the challenges (academic and personal) that I faced during all this time.

Thanks to Sami's insistences to apply to the Nordic Research School in International Business (Nord-IB) doctoral program, I have had two years the privilege of learning and spending time with the most prestigious researchers and professors in IB from the best universities of Finland, Sweden, Denmark, Norway and UK. I have met there incredible people that actually made me understand how full of satisfactions (professional and personal) academic life could be. I want to express my gratefulness to all members of the NordIB family (researchers and doctoral students) for the invaluable experiences. I'm grateful especially to Rebecca Piekkari, Rudolf Sinkovics, Kristiina Mäkelä, Ulf Andersson, Ulf Holm, Timothy Devinney and Peter Buckley, from whom I had the chance to learn much.

Professor Jorma Larimo played an important role during my doctoral courses, academic conferences and doctoral tutorials at School of Management, University of Vaasa. I want to thank him for succeeding at every course to motivate me with his overflowing energy and words of wisdom.

I have been privileged to be part of the LUT academic team, and I sincerely want to thank all my colleagues and fellow doctoral students at the LUT, but especially Sanna-Katriina, Igor, Hannes and Anisur for their encouragement and inspiring discussions.

Also, my gratitude goes to Tamer Cavusgil and Arto Ojala, for their valuable feedback and for their time and commitment as pre-examiners of my dissertation. It's a great honor to have you both as opponents.

I'm eternally grateful to my family. To my wife, she is the pillar of my world. She continued to motivate me even with the price of our time together. When I felt touching the bottom, she always knew how to gracefully raise me up. To my mother and father, they have always provided the best kind of supportive attitude and for believing in me even when I had doubts. To my brother and sister for challenging me many time in order to improve myself.

In Bucharest, during the COVID-19 pandemic.
October 2020
Ioan-Iustin

Contents

List of publications

This dissertation is based on the following papers. The rights have been granted by publishers to include the papers in dissertation.

Publication I

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S. (2019). Digitalization of companies in international entrepreneurship and marketing. *International Marketing Review, 37(3), 471-492*.

Conducted the literature review, analysis of the selected companies, and wrote most parts of the research paper with help, in terms of feedback and small revisions, from co-authors. The theoretical framework and company classification were developed together with co-authors.

Publication II

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S. (2019). Internationalization of born digital companies. In A. Chidlow, P. Ghauri, T. Buckley, A. Qamar, E. Gardner & E. Pickering (Eds.), *The Changing Strategies of International Business: How MNEs Manage in a Changing Commercial and Political Landscape*. Cham: Palgrave Macmillan.

Conducted the literature review, analysis of the selected companies, and wrote most parts of the research paper with help, in terms of feedback and small revisions, from co-authors. The theoretical framework and company classification were made together with co-authors.

Publication III

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S. (2020). The role of digitalization on the internationalization strategy of born-digital companies. Accepted to the *47th Academy of International Business UK & Ireland Chapter Conference*, Adam Smith Business School, University of Glasgow.

Conducted the company interviews and empirical analysis, and wrote most parts of the research paper with help, in terms of feedback and small revisions, from co-authors. Together with co-authors were designed the semi-structured interview and testing.

Publication IV

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S. (2020). The impact of digitalization of value-chain activities on international performance of born-digital

companies. Accepted to the *47th Academy of International Business UK & Ireland Chapter Conference*, Adam Smith Business School, University of Glasgow.

Gathering and analysing questionnaire data, and wrote most parts of the research paper with help, in terms of feedback and small revisions, from co-authors. Together with co-authors were realized the research plan, questionnaire and testing.

1 Introduction

Digitalization has changed the rules for building marketing strategies, and internationalization of companies. The process of digitalization enables the creation of new digital or digitally enabled products and business models, such as online marketplaces and on-demand mobility services, and the enhancement of traditional ones. Digital technologies also transform innovation processes, as big data analytics, virtual simulation, and 3D printing offer new opportunities for developing, prototyping, and testing new products. The actual drivers of these transformations are intelligent devices that are digitally linked through software and hardware technologies to physical assets and generate massive meaningful volumes of data that can be comprehensively analyzed to identify efficiencies that can drive new business value.

Digitalization refers to the use of digital technologies to improve a business model to provide new revenue and make the most of value-producing opportunities (Acedo & Jones, 2007; Brennen & Kreiss, 2014; J. Li, Merenda, & Venkatachalam, 2009). Nevertheless, not all actors are embracing the potential of digitalization, which risks widening the productivity gap between the tech leaders and the rest (OECD, 2019).

Owing to digitalization, online customers/users *expect* speed, simplicity (Brouthers, Geisser, & Rothlauf, 2016), convenience, and relevance (Hänninen, Smedlund, & Mitronen, 2017). Therefore, digital enterprises create a foundation for this phenomenon and further given rise to *digital entrepreneurship* (DE), which calls for new research approaches and explanations to fully understand the role of digital technologies in entrepreneurial pursuits (Nambisan, 2017). Indeed, in this regard, a completely new type of company has emerged, defined by Brouthers et al. (2016) as any "firm operating online that provides its products/services to customers using the Internet and other computer-based information system technologies" (p. 513), and that bases its business strategies on the latest web and mobile technologies and the larger phenomenon of digitalization.

Due to the emergence of this phenomenon, novel approaches must be developed to encompass these new type of organizations; moreover, these can help in developing a much-needed nuanced understanding of the impact of digitalized value-chain activities on internationalization (Cavusgil & Knight, 2015; Nambisan, 2017; Wentrup, 2016). There are two major gaps in the current knowledge on these activities and the present thesis aims to respond to these gaps.

Digital technologies provide businesses with increasingly efficient ways to internationalize by *digitalizing* parts of their value chain (Abaidi & Vernette, 2018; Bhatt & Emdad, 2001; Cenamora, Rönnberg Sjödin, & Parida, 2017; Da Rocha, Simões, de Mello, & Carneiro, 2017). Prior research on digital entrepreneurship has mainly focused on entrepreneurship as practiced in technology-intensive environments, wherein

technology is treated merely as a context (Koh & Nam, 2005; Wentrup, 2016). Limited effort has been made to explore and theorize the role of digitalization on value-chain activities related to internationalization strategies and their outcomes in terms of international success (Cahen & Borini, 2019; Crick & Crick, 2014; Rasmussen & Tanev, 2015; Stallkamp & Schotter, 2019).

However, research has only partially captured the impact of the digitalization of the value-chain on the internationalization of companies, focusing particularly on downstream activities (e.g., delivery, marketing and sales, support) (Bell & Loane, 2010; Brouthers et al., 2016; Crick & Spence, 2005; L. Li, Qian, & Qian, 2012; Wentrup, 2016; Zou, Chen, & Ghauri, 2010) and less on upstream activities (e.g., creating, producing) (Abrahamsson, 2016; Campos, del Palacio Aguirre, Parellada, & de la Parra, 2009; Luo, Zhao, & Du, 2005; Singh & Kundu, 2002). Although marketing and sales are often core elements of early internationalization, this focus on downstream activities offers an incomplete image of the international activities and strategies of BD companies (Buckley & Strange, 2015; Gary Gereffi, Humphrey, & Sturgeon, 2005; Hernández & Pedersen, 2017).

Overall, both upstream and downstream activities can provide access to different types of knowledge from different sources (suppliers, partners, users, competitors, market, etc.) and offer opportunities for growth and improve the international performance of a company (Hernández & Nieto, 2016; L. Li et al., 2012; Wentrup, 2016). Literature reveals that the digitalization of downstream value-chain activities such as marketing, sales and support tends to increase the international performance of upstream activities, particularly by improving R&D by driving innovation that is based on customers' input and behavioral data (Almor, Tarba, & Margalit, 2014; Crick & Spence, 2005; Hennart, 2014; Luo et al., 2005; Mahnke & Venzin, 2003). However, results of this thesis indicate that digitalized companies may be expanding their international presence particularly based on their digitalized upstream value-chain activities and that in certain cases this may entail a greater number of performance consequences.

Extant research (Brouthers et al., 2016; L. Li et al., 2012; Luo et al., 2005; Su, 2013; Zhu & Qian, 2015) has applied different terms in attempting to capture the internationalization of digitalized companies in international business (IB), international entrepreneurship (IE) and international marketing (IM), describing them as *e-business* (Brouthers et al., 2016), *high-tech companies* (Almor et al., 2014; Crick & Spence, 2005; Juho & Mainela, 2009; L. Li et al., 2012; Ojala & Tyrvainen, 2006; Styles & Genua, 2008; Su, 2013; Zhu & Qian, 2015), and *digital information goods providers* (Mahnke & Venzin, 2003; Wentrup, 2016), although a consolidated overview remains missing.

Therefore, this thesis contributes to IB, IE and IM by attempting to solve the inconsistency that embeds all these companies on common grounds (Internet solutions and other digital technologies) under the term *born-digital* (*BD)* companies (Vadana, Torkkeli, Kuivalainen, & Saarenketo, 2019a, 2019b). These are services or

manufacturing companies[1] in which all core activities of the value-chain are digitalized or coordinated by digital technologies at inception or soon after. This implies that primary activities (upstream: for example, creating and producing; downstream: for example, delivery, marketing and sales, and support) are digitally enabled (activated or coordinated by Internet applications or other types of technologies). BDs are companies that were digitalized early after foundation or were fully digitalized from day one (such as HelloFresh or Global Fashion Group). These are companies that either underwent the transformation (or began as digitalized companies) at inception, operate online, and are characterized by their easier approach to accessing foreign markets compared to low-tech companies. However, others (Monaghan, Tippmann, & Coviello, 2019) have also suggested the reality of BDs and that, indirectly, these type of companies can influence entrepreneurship research; thus, here, we extend this research to examine entrepreneurship from the international perspective.

In sum, since digitalization is a developing reality in entrepreneurship (Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016), we argue that in addition to the existent intensive theoretical and empirical research regarding the internationalization of BD companies and how digital solutions enable them to go international much faster with fewer resources (Bell & Loane, 2010; Hagen & Zucchella, 2011; Loane, McNaughton, & Bell, 2004; O'Reilly, 2004), the present study builds on the research of Nambisan (2017), Wentrup (2016), and Brouthers et al. (2016) and tackles the novelty of the role of digitalization of value-chain activities on the internationalization strategy and international performance of BD companies. Thus, this thesis focuses on finding answers to the following main questions: *What are BDs? What impact does digitalization across the value-chain have on the international strategy and performance of BD companies?*

The thesis is based on a set of four papers in which I attempt to explore and analyze the phenomenon of BDs from two perspectives: digitalization of the value-chain and degree of internationalization. Such research can enrich knowledge on IB, IE and IM. The managerial implications of this research include identifying better means to enhance the potential of BD companies in their effort to enter international markets.

[1] These two terms, “manufacturing companies” and “product companies,” are used in this research in an interchangeable manner and refer to companies that develop tangible objects.

1.1 Positioning of the study

Digital infusion is rising exponentially and this transformation is disrupting even the most conservative industries, thereby creating customer (e.g., individuals and corporate) pressure on long-established businesses to compete with digitalized companies. Accordingly, traditional "brick-and-mortar" retailers are caught in a challenging storm: from the invasion of unicorns[2] (e.g. Amazon, Facebook, Google) into every inch of the market, to changing consumer attitudes—as busy people demand an ever more efficient shopping experience—margins (e.g. cost, delivery, stock) are being squeezed like never before.

Research and media have recorded in the last several years the existence of a type of companies (Bell & Loane, 2010; Brouthers et al., 2016; Wentrup, 2016) that base their business development on the latest technologies. Digitalization implies coordination of value-chain activities using Internet infrastructure and web and mobile technologies, which are collectively termed *digital technologies* (Acedo & Jones, 2007; Brennen & Kreiss, 2014; J. Li et al., 2009). Broadly, however, value-chain digitalization describes the proportion of activities that are performed online (Kollmann & Christofor, 2014). Digitalization affects the functions and activities of a number of companies. For example, marketing and sales strategies, and after sales support are key activities in keeping or winning new customers, and improving business decisions based on algorithms crunching big data (Hänninen et al., 2017). This could help companies serve faster and more efficiently their online customers located around the world.

Scholars (Bell & Loane, 2010; Hamill, Tagg, Stevenson, & Vescozi, 2010) have suggested that the Internet creates easy paths to internationalization for companies and offers new ways of doing business. Yet, research is scarce on defining, and classifying digitalized/digitalizing companies, and identifying the consequences of interaction between digitalization of value-chain activities (upstream and downstream) and internationalization. These are important aspects to address in IE and IM literature because digital technologies provide businesses with increasingly potent ways to internationalize by *digitalizing* activities of their value-chain (Wentrup, 2016).

Thus, it is evident that the arrival of BD companies in almost all sectors of activity was made possible by the development of the Internet infrastructure (Addison, 2006; Bell & Loane, 2010; S. H. Lee, DeWester, & Park, 2008; O'Reilly, 2007) and web and mobile technologies (Barassi & Treré, 2012; Fuchs et al., 2010; Hendler, 2009; Lassila & Hendler, 2007). However, despite these developments, entrepreneurship in a digitalized context is considered a distinct topic (Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016).

[2] They are called "unicorns" primarily due to their rapid growth and their market valuations of $1 billion or over.

Nevertheless, extant papers (Brouthers et al., 2016; L. Li et al., 2012; Luo et al., 2005; Su, 2013; Zhu & Qian, 2015) have utilized different terms in attempting to capture the impact of digitalization on international business and entrepreneurship. Due to the emergence of this phenomenon, existing or novel approaches must be developed to grasp these type of organizations and their endeavor for internationalization; these approaches, in turn, can help in developing a much-needed nuanced understanding of entrepreneurship and internationalization in the twenty-first century (Nambisan, 2016; Wentrup, 2016; Cavusgil & Knight, 2015).

Therefore, in the previous two decades, there has been an explosion of research on the process of rapid entrepreneurial internationalization (Freeman, Edwards, & Schroder, 2006) and how advanced technologies that are developed with Internet solutions facilitate faster foreign market entry, even for small enterprises that can otherwise be constrained by a lack of resources (Bell & Loane, 2010; Hagen & Zucchella, 2011; Loane et al., 2004; O'Reilly, 2004). However, this research focuses much more on the downstream activities of companies (e.g., delivery, marketing, and sales support) of the value-chain (Bell & Loane, 2010; Brouthers et al., 2016; Crick & Spence, 2005; L. Li et al., 2012; Wentrup, 2016; Zou et al., 2010) and less on upstream internationalization activities (Abrahamsson, 2016; Campos et al., 2009; Luo et al., 2005; Singh & Kundu, 2002), despite the fact that both aspects play an important role in the company's overall internationalization decisions (G. Gereffi & Fernandez-Stark, 2011; Hernández & Nieto, 2016; Hernández & Pedersen, 2017; Nambisan, 2017). For example, the conceptual studies by Nambisan (2017); Vadana et al. (2019a), and Vadana et al. (2019b) suggest that research must assess the internationalization of BD companies[3] by analyzing the degree of digitalization (DOD) of their value-chain activities (upstream and downstream) in relation to the degree of internationalization (DOI) of the online–offline geographical dispersion of its value-chain activities in foreign markets.

In addition, international business research on BD companies is fragmented in terms of the theories they employ to explain the activities of these companies; therefore, it is important that this research be consolidated (Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016). However, single theories may not be sufficient to explain the phenomenon fully, as previous research (Su, 2013; Vadana et al., 2019b) has revealed that digitalized companies do not follow a specific internationalization strategy but generally combine online-offline elements—such as digital technologies (Kallinikos, Aaltonen, & Marton, 2013), organizational activities (Hernández & Pedersen, 2017), and social networks (Baker et al. 2003)—to achieve their goals.

The nascent research archetype suggested by Edmondson and McManus (2007) was followed to design this research (as little or no previous theory exists), and an inductive analysis was employed to investigate BD companies through research questions. It is

[3] Not all BD companies conduct intense international activities, even though it could be rather easy for them to begin selling online to international customers rather easily from inception.

important to analyze the role of the digitalization of value-chain activities (upstream/downstream) on the internationalization strategy of BD companies with a focus on market selection, market entry, choice of operation mode, and development of the service or product offering.

Digitalization creates an emergent business environment that further adds to the ability of firms to internationalize and perform in the global business environment. However, according to extant literature, company performance depends largely on the adoption of web and mobile technologies and the use of Internet infrastructure, which will both leverage their business offers (products or services) and upgrade their operations globally along value-chain activities (Kraus, Palmer, Kailer, Kallinger, & Spitzer, 2019; Nambisan, 2017; Man Yang & Gabrielsson, 2018).

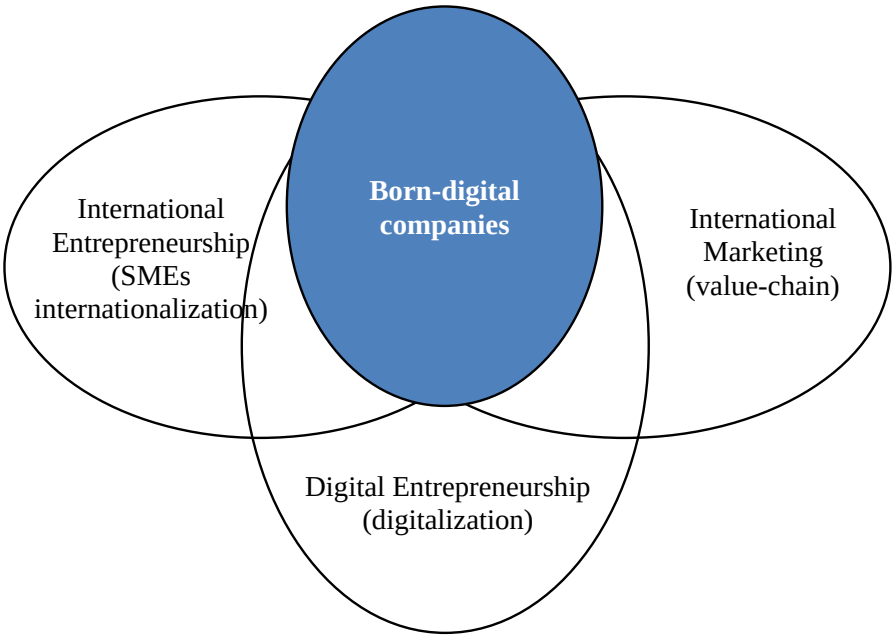
As mentioned earlier, scant attention has been paid to upstream activities (e.g., creating, producing). This constitutes a notable omission in extant literature, as even though marketing and sales are often the core elements of the early phases of internationalization, focusing on downstream activities offers only a partial picture of the functions and their impact on strategies used by digitalized firms to go international (G. Gereffi & Fernandez-Stark, 2011; Hernández & Nieto, 2016; Koh & Nam, 2005; Ni, 2016).

Broadly, in a digitalized value-chain, all the activities are performed or coordinated over Internet networks and through web and mobile technologies. Management literature uses the terms *global value-chain* (G. Gereffi & Fernandez-Stark, 2011; Hernández & Pedersen, 2017) and *global factory* (Buckley, 2011; Buckley & Ghauri, 2004) to describe the situation in which a certain proportion of a company's activities are conducted in other countries. This paper refers to the *value-chain* as defined by Porter (1985).

Extant research reveals that adoption of one or more digital technologies leads to better international performance in general (Abaidi & Vernette, 2018; Chen & Kamal, 2016; Gabrielsson & Gabrielsson, 2011; J. Li et al., 2009; L. Li et al., 2012; Luo et al., 2005; Martinez-Noya, Garcia-Canal, & Guillen, 2012; Susarla, Anitesh, & Whinston, 2003). Companies become international not only based on international sales but also other activities (e.g., supply chain, R&D, development, storage and delivery, etc.) that play an important role in the success of internationalization.

Figure 1 depicts the theoretical positioning of the study within the literature. It indicates the relationships between the born-digital and research field tackled in this thesis. The research gap that this study aims to respond to arises at the intersection of the research on the internationalization, digitalization, and value-chain activities of small and medium enterprises (SMEs). Therefore, it includes elements from IM and DE, both rooted in IE, a research field at the crossroads of international business and entrepreneurship and one where the studies on SME internationalization are conducted in the context of BD companies.

Figure 1. Theoretical Positioning of the Study



The main objectives of this study are presented in detail in the following sections and are related to analyzing, measuring, and classifying digitalized/digitalizing companies and to find the implications of digitalization across value-chain activities on international strategy and performance of BD companies.

1.2 Research Objectives

Extant literature refers to digitalized companies with various terms (e.g., *e-business high-tech companies*, *digital information goods providers*); however, broadly, they view a digitalized company as any organization that provides its products and services to customers using the Internet infrastructure, and web and mobile technologies (Bell & Loane, 2010; Nambisan, 2017; Wentrup, 2016). Thus, it is has become much faster and efficient to create links among most industries and customers based on web platforms or mobile apps enhanced by e-commerce solutions (Wentrup, 2016). Moreover, since digitalization is a growing phenomenon (Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016), we attempt to fill the gap in extant literature that does not describe (define) digitalized companies as a whole and does not sufficiently describe the impact of digitalization of the value-chain on internationalization.

Thus, the first couple of research questions (RQ) of this dissertation were to develop a definition of digitalized companies, to explain the phenomenon, to measure it, and to classify these companies using a conceptual model:

> RQ1: How can the DOD and DOI of digitalized/digitalizing companies be measured?

The value-chain describes an entire set of actions that companies perform to bring products or services from an idea to end-use and aftersales support. In general, a company gains competitive advantage from how it design the value-chain or the activities involved in creating, producing, marketing and selling, delivering, and supporting its products or services (Porter & Kramer, 2011), to cover the needs of a specific market.

We conducted an exploratory study that tackles the novelty of international digital entrepreneurship or the internationalization of BDs. It is based on secondary literature and highlights the existence of a new phenomenon related to BD companies from two perspectives—DOD of the value-chain and DOI. A conceptual research framework was used to analyze and classify a selected sample of 18 companies. Addressing such an important gap in the literature in the context of digital companies, the following is the next research question of this study:

> RQ2: How can born-digital companies be described based on the role of digitalization of the value-chain on internationalization?

A growing number of studies investigate how web technologies and internet infrastructure influence the internationalization strategies of companies (L. Li et al., 2012; Nambisan, 2017; Wentrup, 2016), thereby suggesting that these aspects facilitate internationalization, for example, through acquisition (Almor et al., 2014; Zhu & Qian, 2015) or through decreasing costs associated with spatial distance—for example, remote customer service or lower travel costs (Arenius, Sasi, & Gabrielsson, 2006). This research focuses on the speed at which a company undergoes internationalization (Heinonen, Nummela, & Pukkinen, 2004; Hernández & Nieto, 2016; Hernández & Pedersen, 2017); tests existing internationalization theories and models—that Uppsala model (Johanson & Vahlne, 1977), the internalization theory (Buckley & Casson, 1976), and model of rapid internet-enabled internationalization (Kim, 2003; Knight & Cavusgil, 1996; Oviatt & McDougall, 1994); and examines the factors that influence a company's propensity for foreign expansion (Luo et al., 2005; Mahnke & Venzin, 2003; Zhu & Qian, 2015). Empirical studies in this field are often descriptive in nature and depict various dimensions of internationalization, such as motivations, foreign market selection, and entry modes (Crick & Spence, 2005; Luo et al., 2005; Mahnke & Venzin, 2003; Ojala & Tyrvainen, 2006).

In summary, existing literature focuses more on the second part of the value-chain (e.g. delivery and storage, marketing and sales, customer support, etc.) and has neglected to analyze the possible digitalization of both parts of the value-chain activities and their impact on the internationalization strategy of digitalized companies. Accordingly, the next research question is mentioned below:

> RQ3: What internationalization strategies do born-digital companies use that take into consideration their digitalized value-chain activities (both upstream and downstream)?

Upstream-downstream value-chain activities combining online-offline operations may increase foreign market knowledge that can bring better international performance (Crick & Crick, 2014; Hernández & Nieto, 2016; Koh & Nam, 2005; Laplume, Petersen, & Pearce, 2016; L. Li et al., 2012; Wentrup, 2016). While digitalized value-chain activities provide information access to customers, suppliers, or even to competitors, and make a large part of the transactions transparent, physical value-chain activities, in case of manufacturing companies, make it possible to assemble and deliver final products according to customer orders (Bhatt & Emdad, 2001).

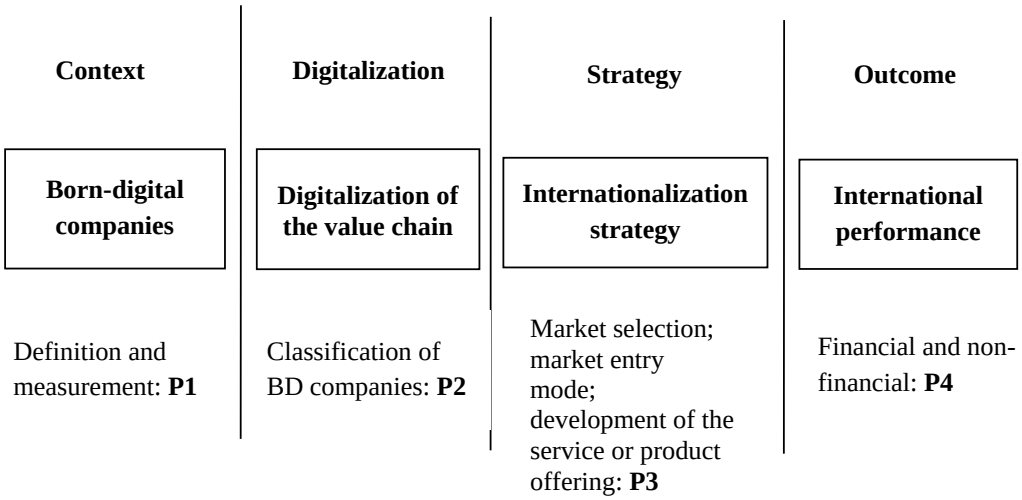
Extant research reveals that the adoption of one or more digital technologies leads to better international performance in general (Abaidi & Vernette, 2018; Chen & Kamal, 2016; Gabrielsson & Gabrielsson, 2011; J. Li et al., 2009; L. Li et al., 2012; Luo et al., 2005; Martinez-Noya et al., 2012; Susarla et al., 2003). However, since digitalization is a developing phenomenon in IB and IE (Kraus et al., 2019; Nambisan, 2017; Man Yang & Gabrielsson, 2018), we argue that in addition to being relatively silent on the topic (Ribau, Moreira, & Raposo, 2018), the information provided in extant literature does not describe the role of digitalization of value-chain activities (both upstream and downstream) in relation to international performance. Companies become international based not only on international sales but other activities (e.g., supply chain, R&D, development, storage and delivery, etc.) that play an important role in the success of internationalization. Against this backdrop, the following question is posed:

> RQ4: What impact does the internationalization strategy of born-digital companies have on international performance?

Overall, bearing in mind the limitations of existing research, the current study explores and describes the phenomenon of digitalized companies defined here as BD companies by analyzing the impact of the digitalization of value-chain activities and internationalization (geographical dispersion of value-chain activities) on the international performance of BD companies; thus, internationalization strategy (mainly market entry modes) is also studied. In brief, this study compares international companies with different levels of digitalization of the value-chain (BD and low-digital—young and mature) and discusses the fact that the existence of a developed digital infrastructure enables digital companies to pop-up in almost every industry, not only in software or hardware industries (Hagen & Zucchella, 2011; Knight & Cavusgil, 2004; Nambisan, 2017; Power, 2014), and also decreases the distance between companies and customers (Kollmann & Christofor, 2014).

Figure 2 shows the publications of this thesis as a series of steps, and indicates the positioning within the research framework (see Figure 4). The figure suggests that digitalization of the value-chain activities determines the international strategy and performance of a BD company. However, high digitalization, as will be advocated in this doctoral dissertation in detail, could potentially lead to enhanced strategy and ultimately better performance.

Figure 2. Publications journey embedded in the research framework



Note: Publication I (P1); Publication II (P2); Publication III (P3); Publication IV (P4).

Thus, exploring the impact of digitalization (Internet infrastructure and web and mobile technologies) to value-chain activities (upstream and downstream), this study discusses the entry market mode, geographical dispersion of the value-chain activities, and development of the service or product offering as part of the internationalization strategy, the applicability and boundaries (in existent theories) in IB field, and the performance implications therein. In this way, several important gaps in the literature were addressed. First, scientifically, this study fills a major gap in the literature, encouraging scholars to conduct more studies on how accurate digital companies can be defined based on their distinct characteristics as well as on how companies can be classified based on the use of digitalization in their value-chain activities. Second, it points out an ongoing research endeavor in IB and tries to explain the internationalization strategy of BD companies and the anticipated international performance implication. Practically, it provides a framework for how managers of BD, or even mature digital companies, can consider the long-term effects of failing to commit sufficient resources to their offline presence in markets with a high psychic distance early in the internationalization process. The research questions, related publications, and their objectives are summarized in Table 1.

Table 1. Research Questions, Objectives, and Existing Publications

Research question	Objective	Publication title	Research method
RQ1: How can the DOD and DOI of digitalized/digitalizing companies be measured?	Define, measure, and classify the internationalization of digitalized companies based on their DOD	Digitalization of companies in international entrepreneurship and marketing	Systematic literature review
RQ2: How can BD companies be described based on the role of digitalization of the value-chain on internationalization?	Conceptualize the idea of the emergence of BD companies	Internationalization of BD companies. The perspectives of using digitalization	Conceptual study
RQ3: What internationalization strategies do BD companies use, considering their digitalized value-chain activities (both upstream and downstream)?	This study aims to analyze the relationship between high digitalization of the value-chain (upstream and downstream) and the internationalization strategy	The role of digitalization on internationalization strategy of BD companies	Qualitative study
RQ3: What impact does the internationalization strategy of BD companies have on international performance?	Clarify how the extent of digitalization across the value-chain activities (upstream and downstream) impacts the international performance and market entry outcomes of internationalizing firms.	The impact of digitalization of value-chain activities on international performance of BD companies	Quantitative study

1.3 Structure

This dissertation provides an overview of the research and comprises six sections. The first section introduces the dissertation and provides the positioning of the study, research objectives (and questions), and definition of the key concepts. Section two discusses the theoretical foundation of this research and briefly reviews digitalization through the perspective of value-chain and internationalization, and then moves on to the internationalization strategy, analysing market entry modes, geographical distribution of the value-chain activities and development of the service or product offering, ending with a presentation of theories and a detailed description of the research framework. Section three describes the research methodology, sampling, and the data collection procedure. Section four provides a summary of the articles in the study, discussing the objective, results, and contribution of each. Section five adds an extra analysis of the various parts

of the value-chain parts (upstream: creating and producing; downstream: delivery, marketing and sales, supporting) comparing BD with low-digital companies to highlight their importance for internationalization. The final section concludes the research and it consists of presenting the theoretical contributions, managerial implications, and the limitations and suggestions for future research. Finally, all four publications are exhibit as results, at the end of this dissertation.

1.4 Definitions of the Key Concepts

1.4.1 Digitalization

Digitalization refers to the use of digital technologies to improve a business model to provide new revenue and value-creating opportunities (Acedo & Jones, 2007; Brennen & Kreiss, 2014; J. Li et al., 2009). This must not be confused with digitization, which is the process of converting any data into digits (1s and 0s) and represents the first step in realizing digitalization (Brennen & Kreiss, 2014). A good example is a company website: the website represents the digitalization of the process (the company can be located online and some of the services are delivered digitally). Thus, the website enables the digitalization of the product in the sense that a digital representation of the product has now become a reality. However, even though the product itself is still physical, there is a digital element to it, and it is also possible to find, view, and compare the product by means of online interfaces.

1.4.2 Internet vs. Web

In research, in general, the Internet and world wide web (also known as Web) are used interchangeably; however, in reality, the two terms are not synonymous but are related. The Internet is a massive network of networks, which connects millions of computers together globally, whereas web services (which use HTTP) enable web and mobile applications to communicate in order to exchange business logic or share information (Beal, 2017).

Technological advances happened in stages known as Web 2.0 and Web 3.0 (Addison, 2006; Barassi & Treré, 2012; Bell & Loane, 2010; Fuchs et al., 2010; Hendler, 2009; Lassila & Hendler, 2007; Musser & O'Reilly, 2006; O'Reilly, 2007). Web 2.0 flourished under the Internet's network effects: "databases that get richer the more people interact with them; applications that are smarter the more people use them; marketing that is driven by user stories and experiences, and applications that interact with each other to form a broader computing platform" (Musser & O'Reilly, 2006, p. 3) . Although Web 3.0 is still under development, it is essentially viewed as semantic web technologies implemented and powered into large-scale web applications (Hendler, 2009; Lassila & Hendler, 2007). Overall, these technologies enable communication and information transparency as well as user collaboration (Addison, 2006; Barassi & Treré, 2012; S. H. Lee et al., 2008), all of which contributed to the rise of BD companies (Bell & Loane,

2010). Owing to these evolutions in web and mobile technologies, BD companies are present not only in the information and communications technology sector but in most industry sectors as well (Bell & Loane, 2010; Brouthers et al., 2016).

1.4.3 Value-Chain

This research refers to the *value-chain* as defined by Porter (1985), who defines it as "…a system of interdependent activities" (p. 48). These activities can be grouped according to various criteria; however, in this thesis, we differentiate them as upstream (creating and producing) and downstream (delivering, marketing and selling, and customer support) (Hernández & Pedersen, 2017; Porter, 1991; Porter & Millar, 1985).

1.4.4 Market Entry Mode

According to Root (1977) entry market mode represent "an institutional arrangement that makes possible the entry of a company's products, technology, human skills, management or other resources into a foreign country" (p. 5). It serves as a strategic path on how a company operates in a foreign market (Gabriel RG Benito, Petersen, & Welch, 2009). Referring to classification criteria market entry modes can be divided in terms of commitment, risk, control(Anderson & Gatignon, 1986; Malhotra, Agarwal, & Ulgado, 2003), or equity versus non-equity (Schwens, Eiche, & Kabst, 2011). In the IB literature, a wide variety of market entry modes have been research in details, for example direct exporting or via a partner, licensing or franchising agreements, international joint ventures or acquisition (Canabal & White, 2008).

1.4.5 Internationalization

One of the most common internationalization modes is defined by Johanson and Vahlne (1977), as a series of steps made gradual to improve the companies' international implications. This process is based on learning and experience, which ends in enhancing involvement and building trust in foreign market (Johanson & Vahlne, 2009). Nevertheless, in IB literature there are other internationalization models – e.g. decreasing commitment in a foreign market or de-internationalization (G.R. Benito & Welch, 1997) or rapid internationalization by born-globals (Bell, McNaughton, Young, & Crick, 2003; Freeman, Hutchings, Lazaris, & Zyngier, 2010).

1.4.6 Geographically distribution of the Value-Chain

Management literature uses the terms *global value-chain* (G. Gereffi & Fernandez-Stark, 2011; Hernández & Pedersen, 2017) or *global factory* (Buckley, 2011; Buckley & Ghauri, 2004) to describe the situation in which a certain proportion of a company's activities are located in other countries. Owing to globalization, it becomes imperative that businesses integrate physical value-chain activities with digital-enabled ones for offering customized products and services to end users (Bhatt & Emdad, 2001; Buckley & Strange, 2015; G.

Gereffi & Fernandez-Stark, 2011). However, even online activities are coordinated across countries by companies from the home country or foreign markets. Literature suggests that although there are numerous reasons underlying the decision to establish value-chain activities in foreign markets, the choice of location does not follow the entrepreneur's nationality or working place but is the result of business strategy (e.g., to reduce bureaucratic delays, ensure fast delivery of goods to foreign markets, etc.) to secure a company's international performance (Alcácer, Cantwell, & Piscitello, 2016; Crick & Crick, 2014; Da Rocha et al., 2017; Hernández & Pedersen, 2017; Lanzolla & Frankort, 2016).

1.4.7 Born-global vs. Born-digital Companies

The global startup definition suggested by Oviatt and McDougall (1994) and it looks like to be good enough to address the context of digital technology startups that have embedded a global marketing strategy from their inception (Tanev, 2017). Namely, born-global companies achieve more than 25% of international sales in less than 3 years since their establishment (Knight & Cavusgil, 1996).

In this research, we define BDs as any product or services company with the entire value-chain activities digitalized at inception or soon after. Not all BD companies are BD firms because some of them are late in digitalizing their activities. The definitions of digital companies found in literature are listed in Table 2 (Vadana et al. (2019a)

However, BDs can resemble born-global (Rennie, 1993) companies in different ways and can even be classified as born-global since digitalization enables many of them to internationalize early and soon after their establishment; however, there are a few differences that may remain. BD companies can internationalize soon after inception or long after. They are considered to have international activities not only because they have international revenue, or because of the amount of this revenue, but also because they are performing value-chain activities in foreign countries. Overall, the context of web and mobile technology is almost taken for granted in numerous existing studies of born-global firms in high-tech industries, without an in-depth analysis of the role of this technology in value-creating activities (Koh & Nam, 2005; Wentrup, 2016) and generally ignoring the inception of this type of firm.

1.4.8 Digital Entrepreneurship

Nambisan (2017) describes digital entrepreneurship through digital artefacts, platforms, and infrastructure. Digital artefacts include digital applications or online content as part of a new product (or service) that offer a specific functionality or value to the end user. Digital platforms serve as places where a shared set of services and architecture host complementary offerings. Digital infrastructure includes systems that provide better communication, collaboration, or computing capabilities.

1.4.9 Bricolage vs. Effectuation

In practice, due to scarcity of existing resources, it looks like BD companies used them to facilitate the creation of something from something else (Fisher, 2012), to overcome the faced challenges. Compared to effectuation, where companies facing unpredictable situations collect information through experimental and iterative learning techniques aimed at discovering the future. Bricolage is about doing with what is available at hand and effectuation is about selecting between a given set means and their possible effects (Fisher, 2012; Harms & Schiele, 2012; Sarasvathy, 2009).

2 Theoretical background

This section provides an overall theoretical background to the doctoral thesis, and it consist of two parts. First part offers an overview of digitalization, value-chain activities, and internationalization and briefly reviews literature on the extant research on digitalization of value-chain activities and their impact on internationalization. The second part presents an overview of the internationalization strategy employed by digitalized companies, particularly those that are BD companies with more interest on market entry modes and distribution of value-chain activities in foreign markets.

2.1 Digitalization

Digital technologies access every aspect of our society: for example, communication, medicine, education, transportation, manufacturing, and farming. Super connectivity—through internet infrastructure, web and mobile applications, sensors, wearables, and smart devices—has blurred the edge between the physical and digital worlds. In the new digital economy, web-based companies that leverage digital infrastructure can enter markets rapidly and navigate with agility (Bell & Loane, 2010; Campos et al., 2009; Jean, Sinkovics, & Kim, 2008; Nambisan, 2017). Correspondingly, entrepreneurs who understand the implications of analytics and big data, artificial intelligence and automation, and cloud computing (outlined in Table 2)—and more importantly how to leverage it—can enable their companies to connect to customers and stakeholders with efficiency and precision, thereby creating new opportunities and staying ahead of competition. Overall, digitalization offers fundamental improvements to traditional business strategies, can transform entire industries, and is a key driver of future growth (Crick & Spence, 2005; Reuber & Fischer, 2011; Singh & Kundu, 2002). Further, as mentioned above, digitalization is the process of amplifying value-chain activities through digital technologies that can provide a digital status to a physical product.

Table 2. The Utilities of Digital Technologies

Type of digital technology	Description
Social media platforms	Develops digital patterns Creates trails of user personalities and choices Helps to know customer better and understand his needs
Cloud computing	Uses the power of networks Affordable digital resources Makes any company appear big, regardless of size or resources
AI and robotics	Machine learning

	Algorithms learn to understand human behavior Suggest next purchase in advance
Big data and analytics	Users are individualized Poll of data collected from web platforms, mobile apps, and sensors Predict future trends and serve unique customers
Mobility and pervasive computing	Internet of things Collect data from any device more naturally Creates big tanks of data

Source: (Bell & Loane, 2010; Brouthers et al., 2016; Lu & Liu, 2015; Nambisan, 2017; Wentrup, 2016)

Product companies combine digital technologies with tangible product value-chain activities, which enhances the overall offering value to their customers (Baines, Lightfoot, Benedettini, & Kay, 2009; Neely, 2008; Ni, 2016). Brouthers et al. (2016) suggest that digitalization of companies that sell a physical product augments their value-chain through *servitization* (Vandermerwe & Rada, 1988), adding service capabilities and solutions to supplement their product offerings (Baines et al., 2009; Neely, 2008; Vandermerwe & Rada, 1988). For example, even online retailers that require the physical distribution of their products increasingly internationalize more rapidly than brick-and-mortar retailers do (Schu, Morschett, & Swoboda, 2016).

Whinston, Stahl, and Choi (1997) used a model with three dimensions to describe the transformation of a product from a physical to digital phase. The **actor dimension** refers to the digitalization that takes place within the company (i.e., implementation of hardware or software solutions) and to which customers do not have direct access (customer relationship management, enterprise resource planning, or intranet). Digitalization of the **process dimension** represents what takes place externally between the company and the customer (e.g., e-commerce platform or application, or even a website). The **product dimension** represents a digitalization of the product or the service that the company sells, which can be monitored through the Internet.

According to Ivang (2008), the model illustrates the extent to which the three dimensions are physical or digital. In this context, digitalization is defined as "*the process by which industrial companies within the actor, process or product dimension is transformed from physical to digital stage*" (Rask, 2001, p. 13). However, this framework is best applied to companies that must undergo the digital transformation process, at least to a certain extent. In addition, BDs are, in general, companies that have undergone that transformation (or did not need to) at their inception.

An online presence for a digital company with a physical product could be represented by a digitalization of the process (the company can be located online and some of the services can be delivered digitally) (Hennart, 2014; Schu et al., 2016; Spence & Crick, 2006; Vadana et al., 2019a). The product is digitalized in the sense that a digital representation of the product is accessible to be viewed and bought from all over the world. However, the product itself is still physical but now it is also possible to find, see,

and compare the product by means of the interfaces that—all things being equal—denotes a digitalization of the product as it is now no longer entirely only physical (Abaidi & Vernette, 2018; J. Li et al., 2009; Lyytinen, Yoo, & Boland, 2016). Therefore, digitalization determines the design and development in a given enterprise for creating and capturing value, thereby determining the manner in which an enterprise operates (Baines et al., 2009; Cenamora et al., 2017; Ni, 2016; Vadana et al., 2019b; Vandermerwe & Rada, 1988).

2.1.1 Digitalized/digitalizing Companies in Research

There is evidence in existing literature that the digitalization of the value-chain leads to the creation of a different type of company (Alcácer et al., 2016; Crick & Crick, 2014; Laplume et al., 2016; Martinez-Noya et al., 2012; Ngoasong, 2017; Rezk, Srai, & Williamson, 2016; Tanev, 2017), which is defined in this paper as a BD company.

Compared to traditional multinational enterprises, digital companies rely more on digital technologies and web infrastructure to exchange information in real-time, thereby enabling rapid responses to customer needs (Luo et al., 2005). In this manner, the data obtained enables enriching and customizing the customer experience through complex algorithms that target consumers based on their behavior (Hänninen et al., 2017). These companies do not act alone in building and managing their value-chain activities but depend on the participation of various actors (e.g. users/customers, partners, online communities, freelancers/consultants, etc.) and the integration of web technologies (Brouthers et al., 2016). In other words, it is not difficult to create a website that can receive orders but it is a somewhat bigger task to make this website work along with the company's other value-chain activities (van Hoek, 2001). Concurrently with the digitalization of the company, activities become more observable, such that business processes or interaction with customers and other stakeholders also becomes digitalized or eventually automated (Ivang, 2008).

One example of a digitalized company analyzed in literature are online platforms (Brouthers et al., 2016; Hänninen et al., 2017; Luo et al., 2005; Ojala, Evers, & Rialp, 2018; Singh & Kundu, 2002), which are less capital intensive, easier to scale, and more profitable in the long-term, as their earnings model is based on selling services to their user base rather than merely maximizing the sales margin. Nambisan (2017) defines digital models as *"a shared, common set of services and architecture that serves to host complementary offerings"* (p. 1032)[4]. The technological complexity provides cost-effective and efficient access to resources. However, in order to take advantage of the technological momentum in the digitalized environment, BD companies require

[4] It must be noted that not all BD companies are service companies or base their business on an SaaS strategy (Vadana et al., 2019a).

capabilities and knowledge that can enable them to leverage their resources and generate value-creating strategies (Singh & Kundu, 2002).

Another example of digitalized companies that is provided in the literature are high-tech SMEs (Crick & Spence, 2005; Juho & Mainela, 2009; Zhu & Qian, 2015). Studies show that combining and integrating existing contacts (Brouthers et al., 2016; Hennart, 2014; Reuber, 2016a); and the development and use of resources—both financial and managerial (knowledge and experience) (Bell & Loane, 2010; Mahnke & Venzin, 2003; Singh & Kundu, 2002)—enables the creation of new solutions to overcome challenges (Su, 2013).

Technology-based companies (Almor et al., 2014; Campos et al., 2009; Singh & Kundu, 2002; Styles & Genua, 2008) are characterized by their proprietary innovative technologies and might initially appear different from digitalized companies, characterized by the utilization of Internet networks and web and mobile technologies as key drivers of business development and rapid internationalization. However, technology-based companies also use the Internet infrastructure and web and mobile technologies to coordinate their value-chain activities and internationalization processes (Nambisan, 2017; Wentrup, 2016).

Highly digitalized value-chain activities enable companies to adapt their product or services to maintain the momentum in their markets. These companies use digitalization to create opportunities to collect data, analyze them, and learn faster than traditional companies. This is possible as these companies can harness internal (company team, partners, suppliers, etc.) and external (users, customers, governance, etc.) feedback more efficiently and improve their existing product or service. Because they are digitalized, these companies are aware—in real time—of their value-chain benefiting from real-time communication and analytics technologies (Abaidi & Vernette, 2018; Bell & Loane, 2010; Kim, 2003; Mahadevan, 2000; Mahnke & Venzin, 2003; Stallkamp & Schotter, 2019), which we discuss next.

2.1.2 Classification and Measurements of Digitalized Companies in Research

Studies use different terms to refer to digitalized companies, such as *e-business* (Brouthers et al., 2016), *high-tech companies* (Almor et al., 2014; Crick & Spence, 2005; Juho & Mainela, 2009; L. Li et al., 2012; Ojala & Tyrvainen, 2006; Styles & Genua, 2008; Su, 2013; Zhu & Qian, 2015), *digital information goods providers* (Mahnke & Venzin, 2003; Wentrup, 2016), *new technology-based companies* (Bell & Loane, 2010; Campos et al., 2009; Mahadevan, 2000; Reuber, 2016b), *accidental internationalists* (Hennart, 2014), or *application service providers* (Susarla et al., 2003). Broadly, however, they view a digitalized company as any firm that provides its products and services to customers using the Internet and other technologies (Bell & Loane, 2010; Nambisan, 2017; Wentrup, 2016).

Most of the studies are based on the traditional classification of internationalizing enterprises, including born-global (low, incremental, and high committers) (Melén & Nordman, 2009), born-internationals (Kuivalainen, Sundqvist, & Servais, 2007; Kundu & Katz, 2003), committed internationalists (Bonaccorsi, 1992), international new ventures (Oviatt & McDougall, 1994), and micro-multinationals (Dimitratos, Johnson, Slow, & Young, 2003).

Most of the measurements in the existing literature referring to the internationalization of digitalized/digitalizing companies focus on linguistic and cultural similarities (Brouthers et al., 2016; Hennart, 2014; Kim, 2003; Mahnke & Venzin, 2003; Reuber, 2016b; Reuber & Fischer, 2011), adaptation versus standardization (L. Li et al., 2012), business model (Hänninen et al., 2017), internationalization speed (Hennart, 2014), online networks (Brouthers et al., 2016), market knowledge (Luo et al., 2005), or online–offline presence (Wentrup, 2016). These companies all generate value using the Internet; however, the literature suggests their internationalization processes may differ (Bell & Loane, 2010; Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016).

Thus, we consider that any classifications and measurements proposed in existing literature do not succeed to fully enclose the actual characteristics of digitalized companies. Therefore, this study employs a conceptual, theoretical research model to classify digitalized companies into two dimensions: the degree of digitalization of their value-chain activities (both upstream and downstream) and the degree of their overall internationalization.

2.1.3 Classification Framework of Digitalized/Digitalizing Companies

We chose to classify different types of organizations, following the example of Oviatt and McDougall (1994) in the context of international new ventures, to emphasize the existence of a novel phenomenon and describe digitalized/digitalizing companies. Thus, a 2 × 2 matrix (Lowy & Hood, 2004) was used to classify these companies (Berrill & Mannella, 2013; Brooksbank, 1991) based on the relationship between age of the company (young vs. mature), DOD (domestic vs. international), and DOI (high vs. low). In addition, this classification was used as a tool to identify the main patterns, based on three dimensions as presented in Table 3, among digitalized/digitalizing companies, thereby highlighting the existence of BD companies in comparison with those that were digitalized subsequently after inception or at the beginning of the road.

Table 3. Classification Dimensions of Digitalized/Digitalizing Companies

Dimension	Description	References
Age of the company	Time since company inception	(Crick & Spence, 2005; Hennart, 2014; Kim, 2003; Luo et al., 2005)
DOD	Upstream value-chain activities	(Almor et al., 2014; Campos et al., 2009; Mahnke & Venzin, 2003)
DOD	Downstream value-chain activities	(Brouthers et al., 2016; Hänninen et al., 2017; Wentrup, 2016)
DOI	Online–offline geographical dispersion of value-chain activities in foreign markets	(Nambisan, 2017; Reuber & Fischer, 2011; Sinkovics, Sinkovics, & Ruey-Jer, 2013; Wentrup, 2016)

Source: Vadana et al. (2019a)

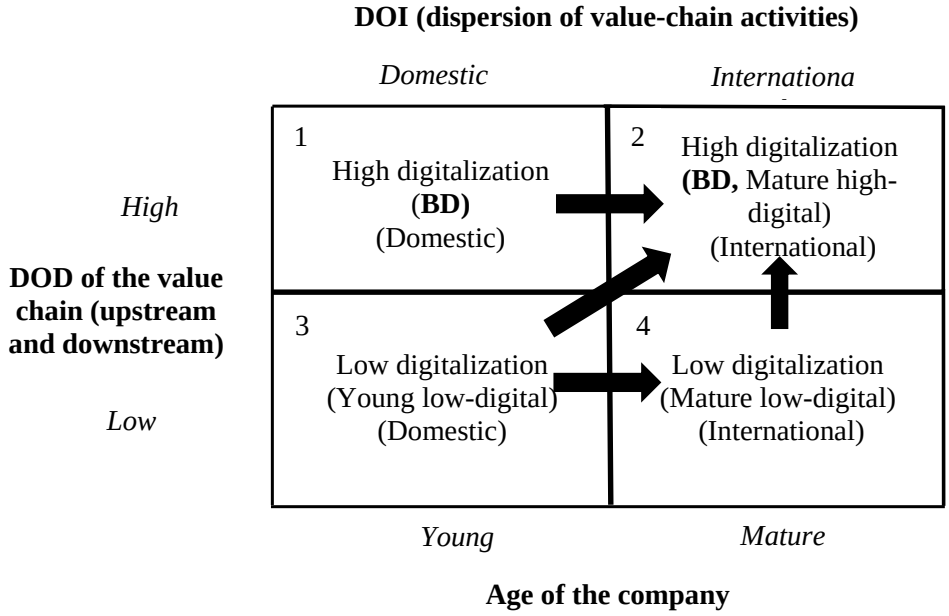
In Figure 3, the horizontal axis captures the time and internationalization dimension (age of the company; domestic/international); the vertical axis captures the DOD of the value-chain activities (high/low). Thus, enterprises in the first quadrant can be referred to as BD companies—companies in which all core activities of the value-chain are digitalized or coordinated by digital technologies at inception, or soon after. In general, they are characterized by their easier approach to accessing foreign markets compared to low-tech companies—a consequence that makes it necessary to shed light on the IM and entrepreneurship activities of BD companies as well.

The digitalized value-chain activities that represent DOD—defined by "high digitalization"—differ in accordance with the nature of the core product. To avoid considering all companies founded in the Internet era as BD, based only (for example) on the use of email as an Internet communication tool, it is assumed that BD companies must have highly digitalized most parts[5] of their value chain straight from their inception or soon after (Figure 3).

The second quadrant in Figure 3 includes BD companies and those with a highly digitalized value chain that experienced the transformation later in time ("mature digital" companies). The third and fourth quadrants comprise companies with a low-digitalized value chain, defined by age as "young low-digital" and "mature low-digital," respectively.

[5] This is an arbitrary criterion, but it helps distinguish between software companies with digital products and those with tangible products.

Figure 3. Classification of Digitalized/Digitalizing Companies



Source: (Vadana et al., 2019a, 2019b)

After analyzing the metrics in the existing literature, the internationalization perspective was measured in terms of the dispersion of value-chain activities online (e.g., development, website translation/localization, online sales/support) and offline (e.g., delivery, global offices, on-site support; (Reuber, 2016b; Sinkovics et al., 2013; Wentrup, 2016). Moreover, to measure value-chain digitalization, the upstream (Almor et al., 2014; Campos et al., 2009; Mahnke & Venzin, 2003) and downstream (Brouthers et al., 2016; Hänninen et al., 2017; Wentrup, 2016) metrics from the literature were employed.

This framework identifies specific types of companies in each quadrant of the matrix. In time, by connecting internationalization with value-chain activities (upstream-downstream), companies can change quadrants. In the first quadrant of Figure 3, not all companies are BD and not all BD companies are international; however, the focus is on those companies that follow an international path, which moves them toward the second quadrant. BD companies can become internationally operating high-digital companies when they move from quadrants 1 to 2; “young low-digitals” become internationally operating low-digital companies when they move from quadrants 3 to 4 but they can also become “mature high digital” by moving, over time, to quadrant 2.

The main differences among the types of companies in Figure 3 are the DOD of the value chain (high vs. low), and the DOI—the online–offline geographical dispersion of activities, domestically and internationally. The horizontal axis measures the number of countries in which these companies have value-chain activities, both offline (i.e., with offices) and online, based on the number of localized websites or domains in a country's official language. Therefore, the first two quadrants comprise BD companies and the other two represent companies in different stages of digitalization, with domestic or international activities. The arrows emphasize the processes of digitalization and internationalization of the company types in quadrants 1, 3, and 4.

An absolute online presence can be surmised at one extreme point, thereby implying that all value-chain activities are run on Internet infrastructure and coordinated by web and mobile technologies. Companies in this category operate almost entirely in a virtual setting. At the other extreme, a purely offline presence implies that only physical resources are present (Wentrup, 2016). In practice, the degrees of online and offline presence may vary over time (Sinkovics et al., 2013). Clear evidence of a balance between online and offline activities is provided by the type of resource involved in the two domains (Wentrup, 2016). In terms of selling and marketing value-chain activity, online entry may be almost instantaneous if a product or service is available online in a specific market. While an offline entry may be more gradual and time-consuming, the necessity of entry appears to increase with time (Wentrup, 2016). In addition, the efficiency of the internationalization strategy enables such ventures to "bootstrap" into international markets.

2.1.4 Degree of Digitalization of the Value-Chain

Creating an overview of value-chain configuration involves an examination of the activities involved. Value-chain activities can be grouped according to various criteria, but in this study we differentiate them as upstream (creating and producing) and downstream (delivering, marketing and selling, and customer support) (Hernández & Pedersen, 2017; Porter, 1991; Porter & Millar, 1985). Previous studies have examined digital value-chain activities: upstream—research and development based on technology and behavioral data, online platform/website (web and/or mobile), online payment system (Almor et al., 2014; Campos et al., 2009; Martinez-Noya et al., 2012; Rezk et al., 2016); downstream—marketing based on social media, analytics, online delivery/last-mile delivery service, online customer care (Brouthers et al., 2016; Crick & Spence, 2005; Shaheer & Li, 2018; Stallkamp & Schotter, 2019).

To the best of the authors' knowledge (see Table 4), research focuses much more on companies' downstream activities (e.g., delivery, marketing and sales, support) of the value chain (Bell & Loane, 2010; Brouthers et al., 2016; Crick & Spence, 2005; L. Li et al., 2012; Wentrup, 2016; Zou et al., 2010) and less on upstream (e.g., creating, producing); (Abrahamsson, 2016; Campos et al., 2009; Luo et al., 2005; Singh & Kundu, 2002). Although marketing and sales are often core elements of early internationalization,

this focus on downstream activities offers only a partial image of these companies' functions and strategies.

Table 4. Papers focusing on upstream versus downstream value-chain activities

Upstream value-chain activities	Downstream value-chain activities	
Mahnke & Venzin, 2003	Brouthers et al., 2016	Stallkamp & Schotter, 2019
Luo et al., 2005	Zhu & Qian, 2015	Javalgi et al., 2012
Campos et al., 2009	Li et al., 2012	**Luo & Bu, 2016**
Almor et al.,, 2014	**Mahnke & Venzin, 2003**	**Chen & Kamal, 2016**
Singh & Kundu, 2002	**Luo et al., 2005**	Hagsten & Kotnik, 2017
Ojala & Tyrvainen, 2006	Crick & Spence, 2005	Watson et al., 2018
Luo & Bu, 2016	Bell & Loane, 2010	Shaheer & Li, 2018
Chen & Kamal, 2016	**Almor et al., 2014**	**Ojala et al., 2018**
Rezk, et al., 2016	Kim, 2003	Caniëls et al., 2015
Ojala et al., 2018	Hennart, 2014	Gabrielsson & Gabrielsson, 2011
Martinez-Noya et al., 2012	Reuber, 2016	Ifinedo, 2011
	Wentrup, 2016	
	Mahadevan, 2000	
	Hänninen et al., 2017	
	Susarla et al., 2003	
	Su, 2013	
	Ojala & Tyrvainen, 2006	
	Styles & Genua, 2008	
	Juho & Mainela, 2009	

Note: The bolded references focus on both parts of the value-chain activities.
Source: Vadana et al. (2019a)

Important aspects captured by value-chain activities—which encompass the entire range of companies' activities to bring products or services from conception to end-use and beyond—might be missed. Companies gain competitive advantage from how they configure the main parts (upstream and downstream) of the value-chain (i.e., creating, producing, marketing and selling, delivering, and supporting products or services) (Porter & Kramer, 2011) (also see Table 5).

One reason for this difference in upstream-downstream studies in extant literature can be that most activities are Internet-related and it can be difficult to track where in their value chains companies have their activities; this is no trivial matter, since core activities are digitalized. This is particularly true when these activities exist in a digital format.

Table 5. Examples of digitalized value-chain activities.

Value chain	Description
Creating	Optimized inventory planning based on demand forecasting Research and development based on technology and behavioral data Integration with partners in a digital ecosystem to optimize service delivery Virtual organizations enabled by mobility and seamless cooperation
Producing	Creating new digital products, services, and offerings Rapid prototyping with customer interaction Integrating products and services into solutions that have digital components Convergence of products enabled by digital technologies
Selling and marketing	Analytics-driven and dynamic customer segmentation or CRM platforms Faster time-to-market with targeted offerings New earnings (subscription, licensing, credit, "freemium," etc.) models Online payment systems
Delivering	Digitalized and automated delivering processes Efficiency of the transportation planning using "last mile" logistics Coordination between storage, stocks and delivering
Supporting	Systematic management of customer management services Digital manuals with instructions powered by augmented reality apps Forums, e-chat, FQA, virtual assistant, social media

Source: Vadana et al. (2019a)

2.1.5 Degree of Internationalization

Digital technologies provide online businesses increasingly efficient ways to internationalize by digitalizing parts of their value-chain and distribute them in other countries to optimize their performance and to lower their overall costs (Brouthers et al., 2016; Ojala et al., 2018; Wentrup, 2016). Management literature uses the terms *global value chain* (G. Gereffi & Fernandez-Stark, 2011; Hernández & Pedersen, 2017) or *global factory* (Buckley, 2011; Buckley & Ghauri, 2004) to describe the situation where some of a company's activities are geographically distributed in other countries.

Many scholars have found that fast internationalization exists only in highly technologized industries (J. Li et al., 2009; Luo et al., 2005; Mahnke & Venzin, 2003). To survive in a dynamic environment, BD companies must adapt very quickly (Bell & Loane, 2010) and grow more rapidly than traditional firms (Brouthers et al., 2016; Wentrup, 2016). However, their business decisions domestically and internationally are coordinated by the core value-chain activities (Almor et al., 2014; Ojala & Tyrvainen, 2006; Zhu & Qian, 2015), to achieve their goals.

Core activities are those needed for sustaining profitable operations that are complementary and important for competitive advantage; non-core activities are those that can easily be outsourced (Hernández & Pedersen, 2017; Oviatt & McDougall, 1994). The evolution of these activities may depend on industry dynamics and changes in the market, which also determine modifications in the structure of the value-chain. Generally, firms retain the core activities they do best in-house, and allocate more resources, time,

and effort to these activities (Buckley, 2011; Buckley & Strange, 2015; Hernández & Nieto, 2016; Hernández & Pedersen, 2017).

Further, internationalization strategy of digitalized companies according to Zhu and Qian (2015) or Luo et al. (2005) make sense in foreign markets with a well-developed Internet infrastructure and with a high dispersion among population of web and mobile technologies as the availability and costs of such services influence success (Mahnke & Venzin, 2003).

2.2 Internationalization Strategy

The literature suggests that digitalization is more than a stimulant for companies; it is a changing context in which new technologies emerge and new capabilities are required (Nambisan, 2017; Reuber & Fischer, 2011; Wentrup, 2016). The arrival of such companies has raised questions, specifically regarding the processes of internationalization. However, the existing studies (Addison, 2006; Bell & Loane, 2010; Berry & Brock, 2004; Freeman et al., 2006; Hamill et al., 2010; O'Reilly, 2007) have been restricted to arguing the advantages that digital technologies and the Internet infrastructure provide adequate conditions for overcoming the barriers to internationalization that these firms often face (Bell & Loane, 2010).

Existing research has largely neglected the role of digital technology in the internationalization pursuits of companies because this subject is novel and information is lacking. Even with the vast IB and IE (Abrahamsson, 2016; Knight, 2000; Moen, Endresen, & Gavlen, 2003; Quelch & Klein, 1996; Webster, 1992), questions remain regarding the conceptualization of digitalized/digitalizing international companies and about their internationalization strategies. Answered questions in this study concern the following aspects: the evolution balance between online entry modes (e.g., translations, localizations, online marketing, challenges with prizes, etc.) that are considered to take less time and resources and offline (e.g., local agents, data centers, offices, etc.) that are specific to mature and young low-digitalized companies (Abaidi & Vernette, 2018; Lanzolla & Frankort, 2016; Roh & Park, 2019; Shankar, Smith, & Rangaswamy, 2003); the distribution of the value chain-activities (Buckley & Strange, 2015; Bukht & Heeks, 2018; UNCTAD, 2017); and the development of the service or product offering (Baines et al., 2009; Cenamora et al., 2017; Neely, 2008; Ni, 2016; Vandermerwe & Rada, 1988).

2.2.1 Geographical Distribution of Value-Chain Activities (Market Selection)

Analyses of the impact of technology on geography suggest that the online and offline worlds are becoming increasingly intertwined (Bukht & Heeks, 2018; Clarqvist, Andersson, & Zwart, 2017; Luo & Bu, 2016; UNCTAD, 2017). Companies choose to geographically disperse their value-chain activities for various reasons (e.g., resources—financial, technology, knowledge, skills—policy, commitment, reputation, competitive advantage, adaptation, etc.), which are empirically documented in extant literature (Alcácer et al., 2016; Crick & Crick, 2014; Da Rocha et al., 2017; Hernández & Pedersen, 2017; Lanzolla & Frankort, 2016). International activities provide access to different types of knowledge from different sources (users, partners, competitors, market, etc.) that provide opportunities for growth and improved international performance of a company (Hernández & Nieto, 2016; L. Li et al., 2012; Wentrup, 2016).

Further, the effect of Internet network and web and mobile technologies on company performance tends to become stronger in a country that places higher demands on digitalization (Rissanen, Ermolaeva, Ali, Torkkeli, & Saarenketo, 2019; Zhu & Qian, 2015). According to Luo et al. (2005), a country in which a large proportion of the population uses the Internet naturally presents itself as a more attractive market for BD companies to begin their business. Economically, a country's Internet ability can influence the marginal costs of transactions and it is an indicator of market attractiveness for digitalized companies (Abaidi & Vernette, 2018; Bukht & Heeks, 2018; Luo & Bu, 2016). It can be assumed that large markets exercise a locational pull on inputs and the existence of key input sources encourage local marketing (Buckley & Strange, 2015; Bukht & Heeks, 2018; UNCTAD, 2017), which could lead to several value-chain activities in the same location (G. Gereffi & Fernandez-Stark, 2011; Hernández & Nieto, 2016). Nevertheless, firms with a heavy geographic spread of value-chain activities may expand into unprofitable markets, thereby hurting a firm's international performance (L. Li et al., 2012).

A degree of digitalization of the market that a company operates in provides the company with a certain type of infrastructure to develop its operations (Benmamoun, Singh, Lehnert, & Lee, 2018; H. Li, Shen, & Bart, 2017; Ofili, 2016). If the infrastructure which fits to providers' technology exist in a market that means market opportunity, which may grow over time (Singh & Kundu, 2002; Wentrup, 2016). For example, according to Kuivalainen, Lindqvist, Saarenketo, and Äijö (2007), in the case of Nokia's mobile phone and network business, the network standards developed from Nordic standard to the European standard and beyond over the years and enabled the internationalization and globalization of the company.

Operating in larger geographical regions (e.g., US, China, and EU) offers learning advantages and economies of scale (UNCTAD, 2017; Wentrup, 2016). The location of different value-chain activities is, in principle, determined by the advantages of different host countries (Buckley, 2011). Identifying these markets is generally closely related with their international success. In the same accord, Wentrup (2016) explains that regardless of the extent of online presence of a firm initially, the geographical impact and the localization aspect become increasingly important as the firm grows.

2.2.2 Market Entry Modes

The results of this thesis indicate that BD companies benefit from a positive relationship between market entry modes and international performance by combining online and offline internationalization approaches. Until a certain point in company growth, for both services and product companies, it could be that offline market entry modes are not necessary (Autio, Sapienza, & Almeida, 2000; Hennart, 2014; Sinkovics et al., 2013).

Nevertheless, despite the results that indicate online as a dominant mode, numerous empirical studies (Sinkovics et al. (2013); Singh and Kundu (2002); Xiao and Dong (2015); Lanzolla and Frankort (2016); Wentrup (2016); Shankar et al. (2003); H. Li et al. (2017); Clarqvist et al. (2017) Roh and Park (2019) have found that online presence along with a brick-and-mortar store as an entry mode strategy increases the success factor, offering users the experience of a product or service before purchase. Second, online presence reduces both process uncertainty and the risk that users associate with making purchases online, thereby improving the international performance of such companies. Further, buyers appear to interpret an online seller's institutional presence as being relatively high in matters of trust and reputation, thereby creating an experiential environment of enjoyment that combines both online and offline experiences (Abaidi & Vernette, 2018; Lanzolla & Frankort, 2016; Roh & Park, 2019; Shankar et al., 2003).

Therefore, combining the click-and-order convenience of online shopping with the brick-and-mortar attributes of offline business provides a value-added shopping and business experience to customers (Singh & Kundu, 2002; Wentrup, 2016). Online technology enables an increasing number of consumers to search for and reserve products or services online first and then to purchase or consume them in brick-and-mortar stores (Akman & Mishra, 2017). Thus, the behavioral intention of users to follow an offline experience is affected by the online component, which implies that businesses require a strong high-quality online presence for operating a successful online-offline experience (Akman & Mishra, 2017; Lanzolla & Frankort, 2016; Roh & Park, 2019; Wentrup, 2016).

Further, there is likely a limit on how long, or up to what size, a digital company can operate online only, without a physical presence (Clarqvist et al., 2017). Depending on the industry, tangible foreign assets continue to be used in international markets, but these are often defined by business offices or data centers (UNCTAD, 2017), which are more necessary for policy issues or customer support. Further, offline presence is necessary not only for practical reasons but also as a symbol of market commitment—for example, for building trust (Benmamoun et al., 2018; H. Li et al., 2017). Being present exclusively online may not be interpreted as sufficient market commitment by potential customers (Abaidi & Vernette, 2018; Fischer & Reuber, 2014; Mahnke & Venzin, 2003; Ofili, 2016; Watson, Weaven, Perkins, Sardana, & Palmatier, 2018).

Overall, this research reveals that early digitalization of the value chain translating into a stronger online presence, followed by a gradual increase in resources dedicated to offline presence may present a solution for the sustainable growth of a company (Gabrielsson & Gabrielsson, 2011; Ifinedo, 2011; Ngoasong, 2017; Watson et al., 2018).

2.2.3 Development of the Service or Product Offering

The center of decisions is generally the home country, because that is where the core resources and innovation of companies lies, and the geographical and physical distance between the foreign market and home country is in, most cases, critical for the company's

success (Rissanen et al., 2019; Rugman & Verbeke, 2004; Wentrup, 2016). Nonetheless, virtual proximity increases the interaction between companies and customers, which eventually leads to innovation (Bell & Loane, 2010; Brouthers et al., 2016). In turn, innovation is known to be a factor that constantly improves connectivity (Luo et al., 2005) and increases growth (Campos et al., 2009). The literature suggests that innovation in digital companies is sustained by user-generated content activities (Brouthers et al., 2016), mass co-creation, and acquired knowledge (Bell & Loane, 2010), which appears to offer them superior networking capabilities, thereby enabling them to build new solutions with available resources and knowledge with help from their own users or partners (Baker & Nelson, 2005; Fisher, 2012; Su, 2013; Man Yang, 2018).

Brouthers et al. (2016) suggest that digitalization of companies augments their value-chain through *servitization* (Vandermerwe & Rada, 1988), adding service capabilities and solutions to supplement their product offerings (Baines et al., 2009; Neely, 2008; Vandermerwe & Rada, 1988). For example, even online retailers requiring physical distribution of their products increasingly internationalize more rapidly than brick-and-mortar retailers do (Schu et al., 2016).

The digitalized activities that show DOD differ mainly in relation to product nature. If the product is tangible, a higher DOD is reached when production and distribution are coordinated with Internet technologies. Servitization also helps tangible products attain a high DOD. Baines et al. (2009) and Neely (2008) argue that servitization offers significant potential value, providing solutions for companies to update their value chain and reap greater benefits by creating more complex and refined products and services.

2.2.4 Theories

Most of the existing research on digitalized companies explains the internationalization strategy through the network theory (Bell & Loane, 2010; Brouthers et al., 2016; Crick & Spence, 2005; Ojala & Tyrvainen, 2006; Singh & Kundu, 2002; Styles & Genua, 2008; Su, 2013; Wentrup, 2016), resource-based view theory (Crick & Spence, 2005; L. Li et al., 2012; Su, 2013), entrepreneurial uncertainty (Fischer & Reuber, 2014), opportunity creation (Chandra, Styles, & Wilkinson, 2012), effectuation (Sarasvathy, 2009), and other internationalization theories (Abaidi & Vernette, 2018; Bell & Loane, 2010; Campos et al., 2009; Kim, 2003; Luo et al., 2005; Mahnke & Venzin, 2003; Singh & Kundu, 2002).

However, the new theorizing elements related to digital technology suggested here may also imply the need to adopt novel approaches that have not been employed to a great extent in entrepreneurship research for identifying and defining this complex emergent phenomena (Nambisan, 2017; Wentrup, 2016). Therefore, this study proposes the notion of entrepreneurial bricolage, described by Baker and Nelson (2005), to explain bricolage as it is practiced by BD companies to develop and implement a company's internationalization strategy.

One possible bridge among existing theories to describe the internationalization strategy of BD companies can be built using the notion of bricolage[6], adapted from Lévi-Strauss (1967) anthropology research. Bricolage represents an effective alternative approach for organizing in a highly uncertain, resource-constrained environment (Baker & Nelson, 2005), since the core activities of BD companies are entirely digital (using digital applications for connecting users) and can be shifted over online channels, which are accessible from anywhere in the world (Brouthers et al., 2016). However, often, one of the common challenges for digital companies is technological uncertainties (due to rapid change in the R&D technology and introduction of new technology), which are occasionally fueled by a lack of resources (Su, 2013; Man Yang, 2018).

In practice, due to the digitalization of the value-chain activities, it looks like BD resource environments are constructed to facilitate the creation of something from nothing (Fisher, 2012), compared to effectuation, where companies facing unpredictable situations collect information through experimental and iterative learning techniques aimed at discovering the future. Bricolage is about doing with what is available at hand and effectuation is about selecting between a given set means and their possible effects (Fisher, 2012; Harms & Schiele, 2012; Sarasvathy, 2009). For example, BD companies can reach customers (users) and partners with digital resources at hand, where low-digital companies use available resources to foresee possible outcomes of their decisions.

According to Man Yang (2018) and Senyard, Baker, and Davidsson (2009), there are different central elements in bricolage among which the following are mentioned: reutilization of existing resources when facing new challenges; implementing resources at hand for improvising new purposes, which could potentially respond to a new problem or opportunity; and taking action with accessible resources assuming that it will help to find a workable solution. However, when firms operate in resource-intensive environments where new challenges must be faced without having access to new resources, bricolage can be employed in five domains: the components, effort, expertise, customer/market, and institutional and regulatory environment domains (Baker & Nelson, 2005), described in Table 6.

Table 6. Domains used in bricolage to create something new from existing resources.

Domain	Description
Components	In the digitalized industries, bricolage is used to infuse new use for technology components
Effort	In the effort domain, bricolage includes persuading customers, suppliers, and partners to provide free data insights.
Expertise	In the expertise domain, bricolage is used to encourage the use of own-expertise to solve a task/challenge
Customer/market	In the customer/market domain, bricolage makes available market offerings.

[6] The process of bricolage is about, "making do by applying combinations of the resources at hand to new problems and opportunities" (Baker & Nelson, 2005, p. 333).

Institutional and regulatory environment	In the institutional and regulatory domains, using bricolage approach could mean refusing to accept limitations brought by regulations and standards.

Source: Updated from Baker and Nelson, 2005

Being constrained, BD companies tend to reuse all kinds of existing resources for different applications rather than those for which they were originally intended (Fisher, 2012; Man Yang, 2018). They end up improvising their strategy, dominated not by clear vision and careful planning but by a process of trial-and-error experimentation utilizing existing resources (e.g. financial, knowledge, human, etc.), pasted-up solutions, and technology components put to unexpected uses (Baker & Nelson, 2005; Senyard et al., 2009). The bricolage approach is considered novel compared to traditional management approaches, as it emphasizes the link to all kinds of resource constraint faced by SMEs in general (Fisher, 2012; Su, 2013).

This uncontrolled approach is closely related to the size and development of a company. Small companies in the growth stage of development are better able to manage market uncertainties, innovate, survive, and perhaps even expand despite lack of resources (Senyard, Baker, Steffens, & Davidsson, 2014). As Baker and Nelson (2005) suggested, bricolage may be damaging at very high levels, but can be helpful if used appropriately.

Nevertheless, it is evident that BD companies build their internationalization strategy by using various available online-offline resources, such as digital technologies, organizational marketing activities, and networks and create bricolage solutions to overcome their international barriers (e.g., human and financial resources, market knowledge, etc.) (Senyard et al., 2014; Su, 2013).

2.2.5 Research Framework

The internationalization of BD companies is receiving increasing attention from scholars, but there is still lack of consensus regarding key factors, definitions, and frameworks. Therefore, I consider it to be particularly valuable to conduct this research that is evidence-based and may add fresh insights to the existing body of literature.

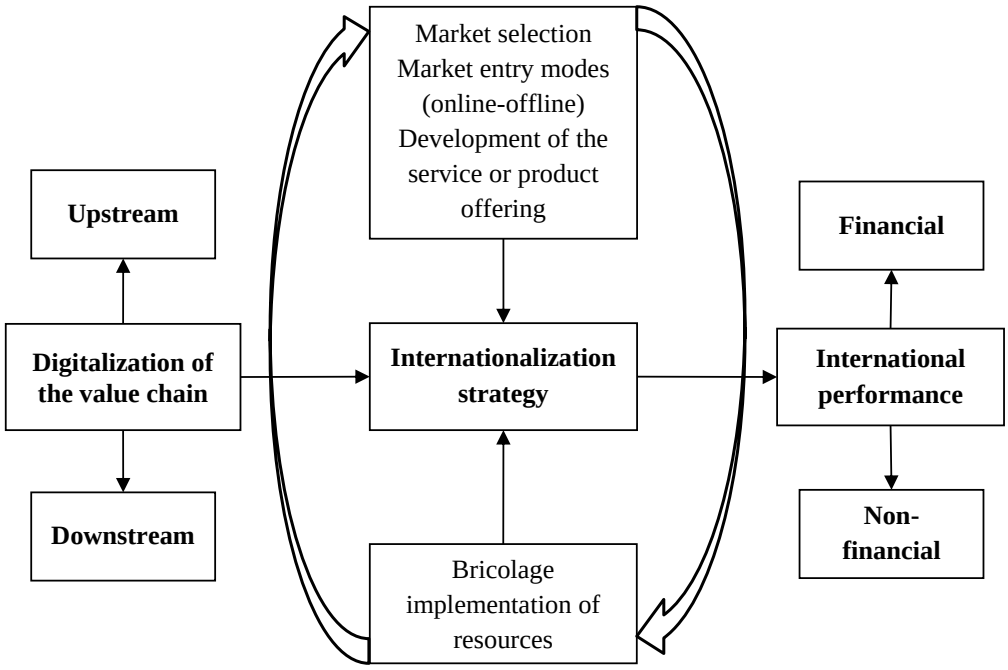
Overall, this thesis contributes to expanding the understanding of how companies conduct international business by extending the discussion on the implications of digitalized value-chain activities (both upstream and downstream) and internationalization strategy on the international performance (measured both from financial and nonfinancial perspective) of BD companies.

Figure 4 indicates that digitalization of the value-chain activities (upstream and downstream) influences the internationalization strategy of companies, which in turn

determines their international performance. However, digitalization, as it is argued in this research, can potentially lead to a digitalized strategy and ultimately to superior performance for a company. In the framework, internationalization strategy is divided into two categories: a list of decisions and the manner in which companies implement these decisions.

First, internationalization strategy can be explained by a series of steps that embeds different decisions or actions, from among which we analyzed the main three presented by the literature (Campos et al., 2009; Hagen, Zucchella, Cerchiello, & Giovanni, 2012; Keupp & Gassmann, 2009), such as market selection, market entry modes, and development of the service or product offering. This research focuses on all three aspects to identify the role of digitalization in how companies build their strategy.

Figure 4. Study Framework



Secondly, being digitalized, BD companies—compared to low digital ones—can reuse most of the existing resources for different roles than those for which they were made for initially (Fisher, 2012; Man Yang, 2018). They end up by improvising their strategy dominated not by clear vision and careful planning but by a process of trial-and-error experimentation combining decisions with existing resources (e.g. financial, knowledge, human, etc.), pasted-up solutions, and technology components put to unexpected uses

(Baker & Nelson, 2005; Senyard et al., 2009). The bricolage approach as being more of on outcome owing to digitalization is considered novel compared to traditional management approaches, as it emphasizes the link to all kinds of resource constraints faced by both BDs and low-digital companies (Fisher, 2012; Su, 2013).

It is evident that BD companies assemble their internationalization strategy by merging various available digital resources and organizational marketing decisions, thereby creating bricolage solutions to overcome internationalization barriers (e.g., human and financial resources, market knowledge; etc.) (Senyard et al., 2014; Su, 2013). This study proposes the notion of entrepreneurial bricolage, described by Baker and Nelson (2005), to explain bricolage as it is practiced by BD companies to develop and implement a company's internationalization strategy. In the following sections, these factors and concepts are analyzed in detail.

3 Research methodology

This chapter first emphasizes the scientific philosophical orientation of the thesis. Then, the discussion moves on to describe the methodologies used and the justification of such methodologies in the light of the overall research questions of this thesis. This is followed by the description of the data collection and analysis methods.

3.1 Scientific and Philosophical Orientation

The aim of this doctoral dissertation is to spotlight the phenomenon of digital value-chain activities in companies' internationalization, with particular reference to their internationalization strategy and performance. Because in the IB literature merge a range of disciplines, it cannot be resumed to only an epistemological position[7]. Epistemology is known as the theory of knowledge, and is in essence "a way of understanding and explaining how we know what we know" (Crotty, 2003, p.3).

Interpretative part of epistemology sustain that natural world is different from the social world and cannot, therefore, be acknowledged in the same way (Hatch & Yanow, 2003). Constructivism represent "a philosophical school of thought arguing that research is fundamentally theory-dependent" (Mir & Watson, 2000, p.941). From this perspective, the theoretical position of the researcher serves to define the research problem and procedures, and what is established as evidence. In the view of Mir and Watson (2000) constructivist researchers look more like craftsmen, who are molding the reality grounded in theory; it turns out that the researcher (subject) and the phenomenon (object) studied cannot be separated and the same reasoning applies to theory and practice. This doctoral dissertation embrace an interpretative constructivist approach in an attempt to clarify complex decisions and activities that characterize the experimentation of digitalization on the value-chain in companies' internationalization.

According to positivism, valid knowledge must be accepted by the senses. However, Tsoukas and Knudsen (2003) research concludes that positivism it does not take into account the conditions under which knowledge is produced. Traditionally, the positivist view has been associated more with quantitative methods. Since these methods attempt to produce causal explanations or even scientific laws, they not only refer to the notion of natural science in their ontology and epistemology, but also employ the same means.

[7] Epistemology is the side of philosophy that investigates what is considered acceptable knowledge in a discipline (Bryman & Bell, 2011)

Finally, the methods always result in numbers, which are then analyzed for a suitable result. According to Crotty (2003) ontology is “the study of being” (p. 10). It is dealing with “what kind of world we are investigating, with the nature of existence, with the structure of reality as such” (Marsh & Furlong, 2002, p.18).

On the other hand, realism offers a singular and certain representation of the past, while relativism offers plural but unfounded narratives that directly oppose the realistic approach. (Durepos, Mills, & Weatherbee, 2012). It's mostly accepted by research tradition that realism holds that all things exist independently, whether they are experienced or theorized by an outside observer (Mir & Watson, 2000). Regarding this point of view, the theoretical statements can be either true or false, and the goal of the theory is always to get as close as possible to the truth. Thus, critical realism and constructivism are more related with qualitative methods.

Critical realism is also the ontology that is generally seen as underlying the post-positivist paradigm (Guba & Lincoln, 1994; Järvensivu & Törnroos, 2010), although not all are keen to associate these two with each other (Easton, 2010; Reed, 2005). Post-positivism is one of the modifications of positivism (other such modifications include logical positivism and logical empiricism). The ontology of positivism is based on naive realism; there exists an actual reality that is apprehensible (Guba & Lincoln, 1994).

In practice, a particular research question seldom falls into only one philosophical domain (Bryman & Bell, 2011) and it is likely that the researcher may reevaluate and redefine the basic beliefs held during the research process. As discussed by Patton (2002), the paradigms are, in a sense, normative and can, therefore, even be regarded as restrictive. In this study, the purpose is to describe and understand a phenomenon as well as to explain the relationships underlying it. In doing so, it is argued that the study benefits from not restricting itself to a solely objective, positivist or purely subjective, constructivist orientation; instead, it enables the research questions to guide the methodological choices. This comes close to a pragmatic philosophical thinking (Patton, 2002).

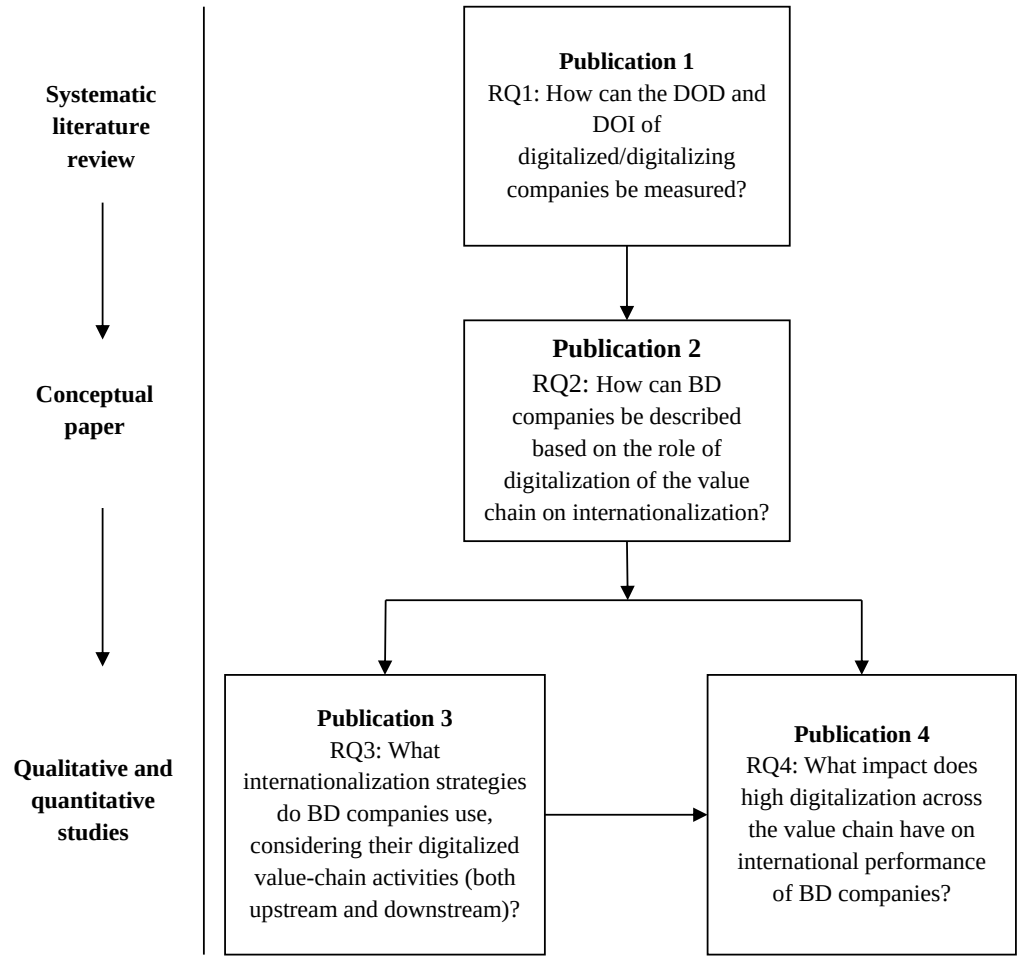
This line of thought responds to the need of IB research to reconcile positivist thinking with alternative realist and interpretive insights and can be identified with the contingency approach too (Coviello & Jones, 2004). Indeed, the aspects of critical realism as well as positivism have been important for the present study, which is phenomenon-based and seeks to understand and explain the contingent-situational and contextual-aspects of the phenomenon through integrating theory from numerous fields and by using both qualitative and quantitative methods in order to address the complexities of the phenomenon as comprehensively as possible (Bryman & Bell, 2011; Patton, 2002).

3.2 Methodological Approach

This doctoral thesis had as starting process a detailed literature review after which the propositions and research gaps were established as grounding points for developing the research papers. A detailed review represent a systematic exploration of existing literature using a transparent, replicable process that helps a researcher to recognize existing gaps, to assess what was already stated and accepted by the research community, and to incorporate in his own research endeavors (Tranfield, Denyer, & Smart, 2003). In general, a main objective of the literature review is to prevent unwanted repetition of previous efforts, and to connect and continue future studies to the research path of previous articles (Petticrew & Roberts, 2006). In addition, it ameliorate the methods processes previously utilized to improve the operations of collecting and synthesizing empirical evidence. (Thorpe, Robin, Allan, & Luke, 2005).

The overall research began with a detailed and systematic literature review on the topics of digitalized/digitalizing companies' value-chain activities and internationalization to identify the existing limitations in the literature, avoid irrelevant reproduction of existing research, and develop a cohesive research plan for the future articles (see Figure 5, Publication I). This provided safe basis to begin a conceptual exploration, followed by qualitative and quantitative studies (Publications III and IV in Figure 5).

Figure 5. Overall Research Design



Further, a conceptual research was performed to cleanse and improve the existing propositions and further develop new ones (see Figure 5, Publication II). Actually, "the heart of any research is its conceptual underpinning in terms of theory or theoretical perspective taken, constructs, models and hypotheses" (Bello & Kostova, 2012, p. 539). For example, poor conceptualization of construction can lead to poor theoretical rationality of hypotheses and low construct validity; this can drive to a low legitimacy of the statistical conclusions (MacKenzie, 2003). Before starting the empirical analysis, it was necessary to establish that the conceptual foundation of this research is sufficient by developing researchable proposals (Whetten, 1989).

Thus, the second publication is a conceptual exploratory analysis of BD companies based on the role of digitalization of the value-chain activities (upstream and downstream) on internationalization. Since digitalization is a developing phenomenon in entrepreneurship (Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016), we argue that in addition to

being relatively silent on the topic, the information provided by existent literature does not sufficiently analyze (qualitatively or quantitatively) the role of digitalization of the value chain in the internationalization of born-digital companies. The significance of such a manner can be pursued to the methods used in the existing literature. It appears that because of lack of other research articles, a conceptual study appears more deemed to address the shortcoming in the literature.

In order to enhance the reliability and validity of the research result, the conceptual argument was endorsed by qualitative data: four *shallow*[8] (Loane, 2006) exploratory cases were built based on secondary sources (Bell & Loane, 2010; Hänninen et al., 2017; Mahnke & Venzin, 2003) to test the proposed framework. This, together with the first publication, served to augment the conceptual depth, to design the study in relation to the existing literature, and to prepare the research for the later phases - to examine more and validate the proposals in qualitative and quantitative studies.

Third, research illustrates the internationalization strategy of BDs by examining their market choice and market entry modes in order to understand the first steps of these companies toward internationalization. In order to gain greater insights and investigate the entry mode strategy of BD companies in greater detail, we followed a comparative case study research method (Eisenhardt, 1989; Yin, 2013), as this method is considered useful to examine the context and features of two or more instances of specific phenomena (Benbasat, Goldstein, & Mead, 1987).

Yin (1994, p. 23) describes a case study as "an empirical inquiry that investigates contemporary phenomenon within its real-life context when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used". Using case study method is "an increasingly popular and relevant research strategy" (Eisenhardt & Graebner, 2007, p.30) for most qualitative studies in the field of IB (Piekkari, Welch, & Paavilainen, 2009). Given the potential of the case study, is not a surprise of the growing popularity of this method, to produce innovative and state-of-the-art theoretical perspectives. (Welch, Piekkari, Plakoyiannaki, & Paavilainen-Mäntymäki, 2011). However, the potential of case study research for theorizing and generalization is still partly recognized in IB field (Welch et al., 2011), and therefore this leads in general to lack of qualitative research (Birkinshaw, Brannen, & Tung, 2011). For example, there is a shortage of qualitative research papers (Cuervo-Cazurra, Andersson, Brannen, Nielsen, & Reuber, 2016) in the top-ranked international business journals, like Journal of International Business Studies (Treviño, Mixon, Funk, & Inkpen, 2010).

The research procedure follows the guidelines developed by Yin (2013) and the recommendations for rigor in positivist case research by Dubé and Paré (2003). We followed a multiple case design. Multiple cases deepen the understanding of a particular

[8] These are called *shallow* by Loane (2006), because cases are made based on secondary literature such as the World Wide Web (WWW), databases/sites, firm websites, and government and industry reports.

phenomenon and help generate more powerful explanations than a single-case design. Further, the evidence from multiple cases is often regarded to have more compelling support for the development of testable hypotheses, thereby rendering the overall study more robust (Benbasat et al., 1987; Yin, 2013). The theoretical basis that guided our selection of case companies was the general description of BD companies, which are services or manufacturing companies in which all core activities of the value chain are digitalized or coordinated by digital technologies at inception or soon after. The high digitalization of the value chain describes the major business components, which helped create an overview of the company business.

Once we determined which companies qualify as BD companies, we selected a sample of three organizations. We looked for companies representing two stages of development (young and mature)[9] and with domestic and international activities. By selecting companies from both stages, it became possible to show that the choice of internationalization strategy used by these companies is not a function of a particular value-chain but can be generalized to the different types of BD companies. Further, we decided to select BD companies headquartered in Finland, with international activities in foreign markets to analyze their internationalization strategy. This approach enables us to compare data across cases to be able to draw generalizable conclusions and develop testable hypotheses. The purpose was to interview top managers in order to better understand the internationalization strategy of BD companies and to describe contextual factors and their behavioral implications. Therefore, this study was an appropriate base for the subsequent quantitative studies.

Table 7. Summary of the research methods

Research question	Method	Data	Outcome
RQ1: How can the DOD and DOI of digitalized/digitalizing companies be measured?	Systematic literature review	Literature from top international business and marketing journals.	Reviewing the literature and finding the research gap; developed measurements and a research model to classify digitalized/digitalizing companies
RQ2: How can BD companies be described based on the role of digitalization of the value chain on internationalization?	Conceptual	Literature from secondary literature; also three comparative cases were used.	Definition and characteristics of BD companies; further testing the classification of digitalized/digitalizing companies on the proposed model.

[9] The stage of development is based on company age: young < 3 years; mature > 3 years.

RQ3: What internationalization strategies do BD companies use, considering their digitalized value-chain activities (both upstream and downstream)?	Qualitative research (Multiple case study)	Interview data from three cases in Finland; complemented by secondary data.	Brings a suitable framework and develops testable propositions to make sense of the discussion on strategy of BD companies.
RQ4: What impact does internationalization strategy of BD companies on international performance?	Quantitative research (multiple regression)	A sample of 152 Romanian firms (domestic and international)	Tested and confirmed hypotheses on the implications of digitalized value-chain activities (both upstream and downstream) on the international performance of BD companies.

Once the qualitative study was performed, the detailed propositions and framework from initial studies were empirically tested and validated using quantitative data and methods (see Figure 5 in Publication IV). This completed the research plan by testing formulated hypotheses in accordance with theories. This helps to mitigate the deficiency of qualitative and conceptual studies - by operationalizing the theoretical constructions and the examination of the strength of the relationships between them (Cuervo-Cazurra et al., 2016). Table 7 summarizes the publications, methodology used, and presents the outcome of each study. The method for collecting data of this research is explained thoroughly in the next section.

3.3 Benefits of Using Mixed Methods

As indicated in Table 7, by using both qualitative and quantitative research methods make this doctoral dissertation a study that applies mixed methods. The two approaches may support each other, as qualitative methodology was used to deepen the understanding of the phenomenon of internationalization of BD companies by analyzing their strategy, while quantitative methodology was used for analysis of measured and generalization validity of relationships among internationalization strategy, digitalization of the value-chain activities, and international performance. Tashakkori and Teddlie (2002) describe de cooperation of positivist and constructivist research paradigms as a third methodological movement; Greene (2008) defines it as a distinctive methodology that enables embracing both traditions simultaneously.

Mixed methods research is being increasingly used and has become an accepted approach to conducting business research, thereby acquiring credibility in the field of business studies. A major similarity between qualitative and quantitative methodologies taken separately and mixed methodologies is that researchers need to keep in mind the initial purpose behind their methodological choosing.

For developing the research questions, I combined qualitative and quantitative methods as this field is still new for entrepreneurs as well as marketing and online marketing experts; moreover, this also enable me to obtain a clear perspective from the respondents. Suddaby (2006) suggests that combining qualitative and quantitative methods must be encouraged, and Eisenhardt (1989) argues that combining qualitative with quantitative data can by highly synergistic.

Eisenhardt (1989) continues by saying that quantitative results can indicate influences that may be thus far unclear to the researcher. Qualitative data are useful for understanding the underlying rational or theoretical relationships revealed in quantitative data or could directly prescribe a theory that can be reinforced by quantitative support (Eisenhardt, 1989). Both methods helped to test the hypothesis proposed in this paper.

I find the idea of mixing several research methods and embedding the data from different sources very interesting for numerous reasons. Quantitative research can provide reliable and valid data if the questionnaire is well tested and the subjects are willing to answer honestly. Qualitative research can provide in-depth information and help create new theories. Further, by combining different methods, the researcher can obtain deeper information by, for example, performing some quantitative research and then conducting deeper research through interviews or other methods. In my opinion, for example, the interviews can deepen and support the analyses of the quantitative portion of the research. This really makes sense when the researcher is willing to make the research as good as possible and to attain the objectives of the study.

3.4 Sampling, Data Collection, and Data Analysis

This section contains the description of the research phases of sampling and data collection included in this thesis. It begins with case selection and data collection for the qualitative study (partially for Publication II, but mainly for Publication III) and continues with data collection and sampling of the quantitative study (Publication IV).

3.4.1 Case Selection and Data Collection for the Qualitative (and Conceptual) Studies

In order to obtain greater insights and investigate the internationalization process of BD firms in greater detail, we followed an explanatory case study research method (Eisenhardt, 1989; Yin, 1994, 2013) since this method is deemed useful when there is no established theoretical base that describes and explains the phenomenon (Benbasat et al., 1987).

Multiple case study research method is particularly appropriate for answering "how" and "why" questions (Yin, 2013, p.9) and enables a more thorough understanding of the behavior of the BDs in terms of internationalization strategy, examined than that possible by a survey or other more deductive research methods. However, the strategies of BDs are complex and, therefore, an in-depth understanding is needed to analyze them and to explain why they were selected in the first place. It's general accepted that case method to finally result in theory development (Eisenhardt, 1989, p.17). The method of multiple case studies is particularly suitable for this research, as it allows the use of theoretical sampling and the use of replication logic that is necessary to examine the framework and proposals of this research. In addition, the evidence of a multiple case study is often considered more convincing, and the study is far more robust than a single case study (Yin, 2013, p.54).

Thus, case study methods can enable the development of new theories (Eisenhardt, 1989; Yin, 2013). Along with explanatory case study research, we adopted a positivist perspective (e.g., Dube & Pare, 2003). This method enabled us to gain knowledge of the internationalization strategy of BD firms and provides a rich description for each selected firm, not only capturing its idiosyncrasies but also enabling us to compare data across cases to be able to draw generalizable conclusions and develop testable propositions.

This research follows the method guidelines of Yin (2013), and concerning the rigor in positivist case research is pursue the recommendations of Dubé and Paré (2003). Instead of single-case study, I conducted a multiple-case design to explore the knowledge of a particular phenomenon and help generate more powerful explanations. Further, the evidence from multiple cases is often regarded to have more compelling support for the development of testable hypotheses, thereby constructing the overall study more powerful (Benbasat et al., 1987; Yin, 2013).

Further, an important element that ensured coherence in this paper was the selection of the case companies. This is an important aspect of building theory from case studies (Eisenhardt, 1989). In order to obtain a representative group of case firms, they must be somewhat similar in terms of their market offering (services over the internet) and to have approximately the same level of internationalization maturity. As emphasized by Eisenhardt (1989, p.537), the "selection of an appropriate population controls extraneous variation and helps to define the limits for generalizing the findings."

The data were collected in late 2018 through semi-structured interviews with top managers (two informants from each BD company) and from external sources (such as company websites and online articles). In all three companies, we interviewed the board of directors, each of whom we refer to as "informant" here. During the analysis, additional questions came up, where we realized that we needed more information on certain aspects. In such instances, we returned to the interviewees and conducted a second interview. All six interviews were recorded and subsequently transcribed. One of the informants was interviewed in person, while the other five were interviewed via Skype. Both types of interviews followed the same procedures. I noted no significant differences in the quality of information provided or in the interview duration between these two techniques. The average length of each interview was 60–80 min.

The case protocol included questions with the goal of developing a clear understanding of the configuration and digitalization of the value-chain activities and the internationalization marketing strategy (and market entry modes, niche market strategy, standardization vs. adaptation strategy) of BD companies. As such, the protocol particularly included open-ended questions to enable participants to comment on issues that they considered important. Further, the questions and the order of asking them were the same for all respondents. This enabled us to collect specific information on the digitalization of the value chain and internationalization strategy to answer the "how" and "why" questions.

More specifically, the case protocol was divided into five sections. The two first sections asked interviewees very specific questions regarding their background (their involvement in strategic decisions and their employment duration within the company) and their company details (description of the product/service and overall sales). The third section requested information on the company degree of internationalization. The fourth set of questions was used to obtain information on the degree of digitalization of their company's value-chain. The last section included questions exploring the company's internationalization strategy. Further, we asked respondents how a certain internationalization strategy was implemented (for each of the strategies suggested), how intensively it was applied, and how successful the strategy turned out for them.

3.4.2 Data Collection for the Quantitative Studies

The quantitative research approach that contain standardized measures and statistical techniques are frequently associated with a positivist paradigm that is related to the

natural sciences. This paradigm is based on the reason that our presumptions must be ignored in order to recognize objective facts based on empirical observations. The purpose of positivist research is to identify generalizable laws that are based on identifying statistical relationships between independent and dependent variables (Durepos et al., 2012; Easton, 2010). Participants in research are selected using sampling techniques designed to eliminate potential sources of bias. Generalization of outcomes are made in general using a sample to a wider population. Methods that correlates with the positivist paradigm enclose structured (or semi-structured) interviews and questionnaires, randomized controlled trials, systematic analyzes, and statistical analyzes of official data (Bryman & Bell, 2011).

The questionnaires (e.g. semi-structured) can be used for both quantitatively and qualitatively individually or for mixed research methods, depending on the nature of the questions. In most of the cases, answers acquired by closed-ended multiple-choice questions are analyzed by quantitative methods and may involve graphs, bar tables, and percentages. The answers obtained to the open questions are analyzed using qualitative methods, and involve critical discussions and analyzes without the use of numbers and calculations.

Another detail is that questionnaires that are implemented at some point in time are known as cross-sectional research design, because they share a picture of what is going on in that group at that moment, and usually involve a descriptive or exploratory form that simply aims to describe behavior or attitudes. If the same process is repeated over the same sample after a time period (e.g. one or two years), then are known as longitudinal research design.

For this study, we used a semi-structured questionnaire over the Internet. The measurement scales in the questionnaire were adapted from established literature whenever possible or we used our own experience for scale development where no suitable operationalization and measurement items could be used from prior studies. We used open-field, multiple-choice, single-choice, and seven-point Likert-type multiple-item scales to operationalize the constructs and variables.

Individuals were contacted by email and invited to participate in the study. The hypotheses were tested with cross-sectional data collected from Romanian SMEs (i.e., independent enterprises that employ between 10 and 250 people). The data were collected through an online questionnaire, with measures on internationalization, digitalization of value-chain activities, market entry modes, and international performance deduced from literature and developed based on our research experience. The questionnaire was created in English, subsequently translated into Romanian, integrated into Qualtrics (see qualtrics.com), and back-translated into English. Data collection began on March 12, 2019 and ended on May 21, 2019. There were a number of refinement rounds, as we also conducted six pilot tests with managers responsible for decision-making on internationalization in order to improve the questionnaire before sending it out.

Two weeks after the respondents received the questionnaire, we sent an email reminder, which was followed by two more reminders in the next two months. The actual respondents were company owners, entrepreneurs, or top managers in the firm. We received 305 filled questionnaires and after the data was cleaned (omitted empty entries, entries with home country other than Romania, entries with over 250 employees, entries with 0 employees, NGOs, governmental organizations, etc.), 151 responses remained.

The sample was classified based on Vadana et al. (2019a) conceptual framework (Figure 3). The horizontal axis represents the DOI, and the vertical axis represents the DOD of value-chain activities. Thus, enterprises in the first quadrant are referred to as BD companies with domestic activities. The second quadrant includes BD companies with international activities. The third and fourth quadrants comprise companies with a low-digitalized value-chain, defined as low-digital[10] companies with domestic and international activities. As evident from Figure 1, from among 151 companies, 54 are BD companies with domestic activities, 54 are born-digital companies with international activities, 25 are low-digital companies with domestic activities, and 18 are low-digital companies with international activities. For more clarity, the entire sample was classified regardless of company age.

The sample descriptions were analyzed by each group, as presented below in Table 1. Groups were created based on digitalization of the value chain and on domestic/international activities. The selected sample comprising BD and low-digital companies with international activities have an average of 19 employees (home country + foreign; SD: 32.98) and they operated, on average, in 3 (SD: 2.88) foreign countries.

[10] Companies that have not yet experienced digital transformation of value-chain activities or are in the process of doing so.

4 Summary of the Publications

This section reviews the objectives, results, and the main contributions of the publications included in this study. Each publication contributes incrementally to answering the main research questions of the dissertation, which were also posed earlier: "*What are BDs? What impact does high digitalization across the value chain have on international strategy and performance of BD companies?*" Accordingly, other sub-questions are posed, each answered in one publication each. The first two publications systematically review the literature and provide a solid ground for succeeding publications by developing a research framework for company classification based on the digitalization of the value chain and international dispersion of its activities. The two next studies address the "how" questions using qualitative and quantitative data, carefully developing propositions. These studies seek to explore the impact of digitalization on internationalization strategy and international performance. In doing so, they include market entry modes of the company as well as the its digitalization of the value chain (upstream and downstream). Table 8 provides a summary of the main objectives, findings, and contribution of each publication. Next, each step is explained in greater detail.

Table 8. Summary of the findings, and contributions of each publication

Publication title	Main findings	Main Contributions
Digitalization of companies in international entrepreneurship and marketing	The more these companies use Internet hardware infrastructure and web and mobile software technologies, the better they can leverage their foreign assets, thereby achieving a higher share of foreign sales with relatively limited foreign assets.	This study finds ways to classify international digitalized/digitalizing companies according to the degree of digitalization of their value-chain activities and internationalization degree of the online-offline geographical dispersion of value-chain activities in foreign markets.
Internationalization of born-digital companies. The perspectives of using digitalization	For internationalization, BD companies employ a balanced approach of online-offline presence on foreign markets, altogether activated by digitalized upstream-downstream value-chain activities from day one or soon after inception.	This research provides a descriptive approach to the new phenomenon formed by international BD companies and uses a framework that enables the classification of BD companies.
The role of digitalization on internationalization	BD companies reuse and mix different resources (online-offline) and improvise solutions	The present study makes an important contribution to the international business literature

strategy of born-digital companies	to solve existing problems and create new opportunities to attain their goals (e.g., internationalization).	by extending discussion on the behavior of BD companies as they strategically approach internationalization efforts.
The impact of digitalization of value-chain activities on the international performance of born-digital companies	The findings indicate that when the Internet and web and mobile technologies are embedded in a company's business activities (both services and product) they positively influence the performance of the company in foreign markets.	This paper expands the understanding of IB by extending the discussion on the implications of digitalized value-chain activities (both upstream and downstream) on the international performance of BD companies.

4.1 Publication I: Digitalization of Companies in International Entrepreneurship and Marketing

Background and Objective

Research and online media indicate the emergence of a new type of companies (Bell & Loane, 2010; Brouthers et al., 2016; Wentrup, 2016) that base their business development on the latest technologies and *digitalization*[11]—the use of digital technologies to improve the business model, providing new revenue and value-producing opportunities (Hänninen et al., 2017; Nambisan, 2017).

Digitalization implies coordination of value-chain activities using Internet infrastructure and web and mobile technologies, known as *digital technologies* (Acedo & Jones, 2007; Brennen & Kreiss, 2014; J. Li et al., 2009). Scholars (Bell & Loane, 2010; Hamill et al., 2010) have suggested that the Internet creates easy paths to internationalization for companies and offers new ways of doing business, yet little research has examined the emergence of digitalized/digitalizing companies (Nambisan, 2017; Wentrup, 2016), beyond online promotion and sales.

This exploratory study focused on testing metrics selected from the literature review (N = 35) and the proposed research frameworks. Few studies have attempted to analyze companies from these perspectives, and the IE and IM literature on digitalization is still in its nascent stages. Thus, based on the understanding of the literature, it is suggested that *born-digitals* (BDs) would be a suitable term for describing different types of digitalized/digitalizing enterprises (Nambisan, 2017; Wentrup, 2016). Suitable metrics were identified for developing an empirical classification of low- and high-digital companies by analyzing several theoretical research models in the existing literature.

[11] This must not be confused with digitization, which is the process of converting any data into digits (i.e., 1s and 0s, in) (Brennen & Kreiss, 2014).

Developing standard definitions, conceptualizations, and metrics increases research clarity as well as the comparability of companies across regions, countries, and specific industries. This work was conducted to close some of the gaps in the literature.

Main Contribution

This study employs a holistic framework to clarify the discussion on digitalization in the context of IB, IE and IM. It integrates the new concept of BD, which explains the digitalization phenomenon through an innovative perspective, analyzing the digital value-chain activities and how they relate with internationalization across two dimensions—online and offline. According to the literature, the interplay between online and offline internationalization and DOD increases knowledge of foreign markets and users, thereby implying that digitalized companies grow more rapidly internationally, thus extending the dispersion of value-chain activities (Autio et al., 2000; Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016; Yamin & Sinkovics, 2006). Going forward, this classification and exploration of the phenomenon (of BD companies) will help in developing a better understanding of the characteristics of digitalized/digitalizing companies, their internationalization strategies, and the resulting international performance.

4.2 Publication II: Internationalization of Born-digital Companies. The Perspectives of using Digitalization

Background and Objective

Digital technologies provide businesses with increasingly efficient ways to internationalize—by *digitalizing* parts of their value-chain (Wentrup, 2016). Indeed, a completely new type of company has emerged that bases its strategy on latest web and mobile technologies and the larger phenomenon of digitalization (Brouthers et al., 2016). The arrival of this type of company in almost all sectors of activity was made possible by the development of Web 2.0 (Addison, 2006; Bell & Loane, 2010; S. H. Lee et al., 2008; O'Reilly, 2007), after the dot-com bubble (O'Reilly, 2004), followed by Web 3.0 (Barassi & Treré, 2012; Fuchs et al., 2010; Hendler, 2009; Lassila & Hendler, 2007).

Building on the research of Nambisan (2017), Wentrup (2016), and Brouthers et al. (2016), we propose that these companies (that is, technology firms, ibusiness, online service providers, etc.) be termed *born-digital* (BD). However, others (Monaghan et al., 2019) have also suggested the reality of BDs and that, indirectly, they can impact entrepreneurship research. Therefore, we now extend this research stream by examining entrepreneurship from an international perspective.

Since digitalization is a developing phenomenon in entrepreneurship (Brouthers et al., 2016; Nambisan 2017; Wentrup 2016), we argue that in addition to being relatively silent on the topic, the information provided by existent literature does not sufficiently describe

the role of digitalization of both parts of the value chain activities (upstream and downstream) that are part of the internationalization efforts of BD companies.

The present exploratory study tackles the novelty of international digital entrepreneurship and analyzes the strategy (decisions and implementation of resources) of BD companies based on the role of digitalization of the value chain as part of internationalization. It is based on secondary literature (e.g., publicly available information about so-called unicorn firms in Europe) and highlights the existence of a new phenomenon related to BD companies from two perspectives: degree of digitalization (DOD) of the value chain and degree of internationalization (DOI). A conceptual research framework was used to analyze a selected sample to classify born-digital companies.

Main Contribution

We observed that the internationalization process of BD companies includes several steps: gradual regional expansion followed by internationalization speed, both of which are supported by Internet technologies. The rapidity of internationalization is best explained by the international venture or the born-global phenomenon (Cavusgil & Knight, 2015; Madsen & Servais, 1997; Oviatt & McDougall, 2005a), information and communications technology (ICT), and Internet-related internationalization theories (Kim, 2003; Singh & Kundu, 2002; Yamin & Sinkovics, 2006). However, the gradual regional pattern finds support in the Uppsala model (Johanson & Vahlne, 1977). Nevertheless, not all BD companies operate internationally, although they could sell to international customers online rather easily from day one.

The contribution of this study is its presentation of a framework that can be used to classify and compare BDs with other companies when examining their internationalization and value-chain activities. By emphasizing the relevance of a digitalized value-chain—both upstream and downstream—and internationalization using a balance between online and offline presence, we present a conceptual analysis arguing that BD companies are a distinct type of internationalizing companies with an upstream-downstream digitalized value-chain from day one or soon after inception.

4.3 Publication III: The Role of Digitalization in the Internationalization Strategy of Born-digital Companies

Background and Objective

Extant research (Brouthers et al., 2016; L. Li et al., 2012; Luo et al., 2005; Su, 2013; Zhu & Qian, 2015) has utilized different terms in attempting to capture the impact of digitalization on international business and entrepreneurship. Due to the emergence of this phenomenon, novel theories must be developed to encompass these new type of organizations; these, in turn, can help in developing a much-needed nuanced understanding of entrepreneurship and internationalization in the twenty-first century

(Nambisan, 2016; Wentrup, 2016; Cavusgil & Knight, 2015). There are two major gaps in the current knowledge on these and the present study aims to respond to these gaps.

This study analyses the relationship between the high digitalization of the value chain (upstream/downstream) and the internationalization strategy focusing on market entry modes. We adhere to the recent definition by Vadana et al. (2019b) of born-digitals (BDs): service or manufacturing companies in which all the core activities of the value chain are digitalized or coordinated by digital technologies at inception or soon after. These are companies that either underwent the transformation (or began as digitalized companies) at inception, operate online, and are characterized by their easier approach to accessing foreign markets compared to low-tech companies—a consequence that makes it necessary, considering digitalization as the main direction for market and research efforts, to shed light on their internationalization strategy or their internationalization in general.

Main Contribution

The cases indicated that international strategy is positively influenced by the digitalization of the value-chain activities (upstream and downstream), which finally improve the international performance of BDs. They combine available online factors—such as web and mobile applications—and internal networks (e.g., existing users), with offline organizational activities and external networks (e.g., partners, similar companies, etc.) to achieve their goals (Vadana et al., 2019b). As it is evident in the previous section, this approach of re-using and mixing different resources (online-offline) and improvising solutions to solve existing problems and creating new opportunities could be explained by the notion of bricolage (Baker & Nelson, 2005; Su, 2013). Therefore, a major implication from the results is that the prevalent internationalization models do not explain BD internationalization strategy; in fact, what they do is engage in entrepreneurial behavior in bricolage. Due to the digitalization of the value chain, it looks like BD resource environments are constructed in such a manner that facilitates the creation of something from nothing (Fisher, 2012). The analyzed sample was consistent in terms of statements of generating value by combining resources to accomplish new challenges that the resources were not originally intended to accomplish.

4.4 Publication IV: The Impact of Digitalization of Value-chain Activities on International Performance of Born-digital Companies

Background and Objective

Extant research reveals that the adoption of one or more digital technologies leads to better international performance in general (Abaidi & Vernette, 2018; Chen & Kamal, 2016; Gabrielsson & Gabrielsson, 2011; J. Li et al., 2009; L. Li et al., 2012; Luo et al., 2005; Martinez-Noya et al., 2012; Susarla et al., 2003).

However, since digitalization is a developing phenomenon in IB and IE (Kraus et al., 2019; Nambisan, 2017; Man Yang & Gabrielsson, 2018), we argue that in addition to being relatively silent on the topic (Ribau et al., 2018), the information provided by extant literature does not describe the role of digitalization of value-chain activities (both upstream and downstream) on the international performance of companies defined here as BD (with international activities)[12]. Companies become international not only based on international sales but other activities (e.g., supply chain, R&D, development, storage and delivery, etc.) that play an important role in the success of internationalization.

Following Vadana et al. (2019a), the current study explores the impact of digitalization of value-chain activities and internationalization (geographical dispersion of value-chain activities) on the international performance of BD companies; thus, the internationalization strategy (mainly market entry modes) of these companies is also studied.

Main Contribution

Upstream-downstream value-chain activities combining online-offline operations may increase foreign market knowledge that can bring better international performance (Crick & Crick, 2014; Hernández & Nieto, 2016; Koh & Nam, 2005; Laplume et al., 2016; L. Li et al., 2012; Wentrup, 2016). While digital value-chain activities provide information access to customers, suppliers, and entrepreneurs and make a large part of the transactions transparent, physical value-chain activities make it possible for them to be realized by fulfilling customer orders and assembling final products and services (Bhatt & Emdad, 2001).

It appears that the high digitalization of value-chain activities positively correlates with the international success that is subjectively perceived by companies. However, it does not correlate with the more objective international performance factors (number of countries and international income) (Almor et al., 2014; Campos et al., 2009; Sinkovics et al., 2013). We consider this result to have several implications and underlying reasons. Importantly, it suggests that coordination of value-chain activities with digital technologies represents a unique and valuable type of competitive advantage for a company in international markets (Abaidi & Vernette, 2018; Bell & Loane, 2010; Campos et al., 2009; Hagsten & Kotnik, 2017; L. Li et al., 2012; Zhou, Wu, & Luo, 2007), but it takes time and skills to improve the company's actual performance.

[12] We mention that not all companies are BD companies and not all BD companies have international activities; however, our focus is on companies that have an international journey.

5 Post-hoc Test

In order to continue the research suggested in the fourth paper and in order to test the role of value-chain activities on international performance, I divided the value-chain activities—both upstream (creating and producing) and downstream (delivery, marketing and sales and support)—in two distinct variables and further test their individual influence on international performance (both objective and subjective). In addition, I retained all the variables used in the Publication IV in the analysis to identify which variables influence the internationalization performance for each company group (overall sample N = 151; international BD companies N = 54; and international low-digital companies N = 18).

5.1 Robustness Checks

First, I performed a two-step cluster analysis in SPSS based on the value-chain activities variables and the number of countries variable to test the classification framework presented in Figure 1 and section 2.1.4. The cluster analysis yielded four groups of SMEs depending on their digitalization degree and their foreign geographical activities, which were termed as "domestic BD," "international BD," "domestic low-digital," and "international low-digital," out of which we selected the two groups with international activities and the entire sample as presented in Table 9.

It is useful to analyze the mean and the standard deviation values of variables across clusters to describe the company groups in more detail. Profiling the groups using variables that are different from those entered in the two-step cluster analysis can help to characterize the clusters more efficiently. As is evident from Tables 9 and 10, all F-values apart from the market entry modes (offline), are statistically significant, which indicates the distinctive attributes of the cluster solution. These two tables provide descriptive information on the focal variables for the entire sample and the subsamples.

Table 9. The Basic Characteristics of the Company Types

Variable		**1.Inter. and domestic - BD and low digital (N = 151)**	**2.Inter. BD (N = 54)**	**3.Inter. low digital (N = 18)**	**F**	**t tests[a]**
1: Age	Mean	2008	2011	1996	*8,99***	1 vs 3, 2 vs 3
	Std. Dev.	12.31	7,36	26,58		
2: Size (employees	Mean	12.58	8,49	29,75	*2,88**	2 vs 3
	Std. Dev.	27.01	19,82	43,45		

national + international)						
3: Digitalization of the value-chain activities (upstream)	Mean	5.44	6,53	3,19	*286,52***	1 vs 2 1 vs 3
	Std. Dev.	1.84	0,39	1,05		
4: Digitalization of the value-chain activities (downstream)	Mean	5,75	6,62	3,92	*310,92***	1 vs 3 1 vs 2
	Std. Dev.	1.38	0,37	0,80		
5: Geographical dispersion of value-chain activities	Mean	1.06	1,12	1,08	*4,86***	1 vs 2
	Std. Dev.	0.16	0,16	0,19		
6: Market entry modes (online)	Mean	0.34	0,34	0,30	*2,45**	1 vs 2, 1 vs 3
	Std. Dev.	0.31	0,29	0,32		
7: Market entry modes (offline)	Mean	0.27	0,26	0,28	0,15	1 vs 2
	Std. Dev.	0.19	0,20	0,17		
8: Objective international performance (number of countries operated)	Mean	2.93	3,16	3,38	*2,70**	2 vs 3
	Std. Dev.	2.96	3,03	2,76		
9: Objective international performance (% of international sales, 2014–2018)	Mean	15.63	15,70	34,71	*3,18**	1 vs 3
	Std. Dev.	23.83	21,74	31,71		
10: Subjective international performance (international success)	Mean	4.31	5,12	4,96	*12,74***	1 vs 2, 1 vs 3
	Std. Dev.	1.66	1,07	1,30		
Note: *p < 0.05; **p < 0.01 [a] Only significant differences are shown (p ≤ 0.05)						

Second, I conducted a one-way analysis of variance (ANOVA) to assess the digitalization differences across the variables of the selected types of companies. I tested the digitalization of the value-chain activities (upstream and downstream) for the groups in terms of the geographical dispersion of the value-chain activities, market entry modes (online and offline), and international performance (objective and subjective) differences among the groups, which is evident in Table 10. We find that the compared groups significantly differ across all the variables, with the exception of the market entry modes (offline).

Table 10. Cluster Differences Based on ANOVA (International and Domestic: Born-digital and low-digital companies)

Variable		Sum of Squares	df	Mean Square	F
1: Age	Between groups	3521,05	3	1173,68	*8,99***
	Within groups	18780,58	144	130,42	
2: Size (employees national + international)	Between groups	6088,52	3	2029,50	*2,88**
	Within groups	101191,50	144	702,71	
3: Digitalization of the value-chain activities (upstream)	Between groups	429,42	3	143,14	*286,52***
	Within groups	71,94	144	0,50	
4: Digitalization of the value-chain activities (downstream)	Between groups	245,22	3	81,74	*310,92***
	Within groups	37,85	144	0,26	
5: Geographical dispersion of value-chain activities	Between groups	0,34	3	0,11	*4,86***
	Within groups	2,84	120	0,02	
6: Market entry modes (online)	Between groups	0,45	2	0,22	*2,45**
	Within groups	6,32	68	0,09	
7: Market entry modes (offline)	Between groups	0,00	1	0,00	0,15
	Within groups	2,61	68	0,03	
8: Objective international performance (number of countries operated)	Between groups	66,93	3	22,31	*2,70**
	Within groups	609,74	74	8,24	
9: Objective international performance (% of international sales, 2014–2018)	Between groups	5024,96	3	1674,98	*3,18**
	Within groups	42133,07	80	526,66	
10: Subjective international performance (international success)	Between groups	78,78	3	26,26	*12,74***
	Within groups	204,00	99	2,06	
Note: *p < 0.05; **p < 0.01					

5.2 Digitalization impact on international performance analysis

Third, in order to further explore the results presented in Tables 9 and 10, we conducted post-hoc analyses. Table 11 presents the results that we used to test the correlation between the variables. As is evident, all the regression models are statistically significant; however, this outcome has different reasons for each of the groups.

For the entire sample represented by the first group (N = 151), the first and third models are negatively influenced by the company age and positively by the geographical dispersion of value-chain activities; only the first model is influenced by offline market entry modes. Moreover, the second model is positively influenced by the size of the company.

In the second group (N = 51), all three models are positively influenced by the upstream portion of the digitalized value-chain and only the third model is positively influenced by downstream portion. The first model is also influenced by the geographical distribution of the value-chain activities and online market entry modes. The second model is positively influenced by the size of the company and the third model by geographical distribution and offline market entry modes.

In the third group (N = 18), the first and third models are positively influenced by the geographical distribution of the value-chain activities and second model by the size of the company.

The key difference among the groups is that international performance, both objective and subjective, of international BD companies is positively influenced, particularly by the upstream (creating and producing) value-chain activities. In addition, geographical distribution and the balance between online-offline market entry modes have an important role in the international performance of companies in all three groups.

Our key suggestion here is that BD companies may be expanding their international presence based particularly on their digitalized upstream value-chain activities and that, in certain cases, there may be increasing performance consequences. In contrast, for low-digital companies, distribution of value-chain activities has a more significant effect on international performance because most part of their value-chain activities are concentrated in offline presence, which requires to scout for markets where they can optimize their activities (e.g., low-cost resources) to increase performance.

I used domestic companies in this model, even though dependent variables are related to international performance, because comparing domestic and international BD companies with low-digital ones reveals that their behavior regarding their business performance is similar. Domestic BD companies optimize their performance owing to digitalization of the value-chain activities, particularly the upstream portion. In cases where low-digital companies have offline activities in most cases, they search for geographical location in their domestic markets to improve the overall performance[13].

[13] However, I am not very sure about the last statement, because in the empirical papers, we concentrated on BDs rather than low-digital companies as comparison.

Table 11. The Results of the Post-hoc Analysis for International Performance

Independent variables	1.International and domestic: born-digital and low-digital (N = 151)						2.International BD (N = 54)						3.International low-digital (N = 18)					
	Mode 1 Objective international performance		**Model 2** Subjective international performance		**Model 3** Total international performance		**Mode 1** Objective international performance		**Model 2** Subjective international performance		**Model 3** Total international performance		**Mode 1** Objective international performance		**Model 2** Subjective international performance		**Model 3** Total international performance	
	β	***t***	***β***	***t***	***β***	***t***	***β***	***t***	***β***	***t***	***β***	***t***	***β***	***t***	***β***	***t***	***β***	***t***
1: Age	-0.43	*-3.64***	0.11	0.73	-0.39	-3.12**	-0.24	-1.60	-0.08	-0.53	-0.26	-1.73	-0.51	*-2.22**	-0.01	-0.03	-0.48	-1.96
2: Size (employees national + international)	-0.10	-0.66	-0.31	*-2.38**	-0.08	-0.53	-0.03	-0.19	-0.38	*-2.12**	-0.30	-1.81	0.16	0.56	-0.55	*-2.37**	0.12	0.42
3: Digitalization of value-chain activities (upstream)	0.30	1.12	0.01	0.08	0.00	0.02	0.29	*1.85**	0.35	*2.17**	0.47	*3.07***	0.10	0.37	0.29	1.25	0.13	0.43
4: Digitalization of value-chain activities (downstream)	-0.42	-1.48	-0.07	-0.52	-0.16	-1.04	-0.30	*-2.02**	0.02	0.12	-0.22	-1.43	-0.30	-0.98	-0.06	-0.25	-0.31	-0.98
5: Geographical dispersion of value-chain activities	0.27	*2.27**	0.13	1.04	0.27	*2.18**	0.24	*1.78**	0.18	2.23	0.31	*2.21**	0.69	*2.53**	0.02	0.08	0.68	*2.47**
6: Market entry modes (online)	0.05	0.45	0.01	0.10	0.07	0.54	0.33	*2.42**	-0.28	-1.87	0.09	0.67	0.25	0.19	0.14	0.59	0.25	0.91
7: Market entry modes (offline)	0.28	*2.11**	0.00	0.06	0.11	0.87	0.16	1.07	0.27	1.57	0.33	*3.33**	-0.12	-0.38	-0.10	-0.36	-0.13	-0.41
Adj. R^2	0.24		0.08		0.21		0.25		0.19		0.29		0.40		0.25		0.39	
F	*3.42***		*5.66**		*4.79**		*3.18**		*2.40**		*3.42***		*6.41**		*5.65**		*6.10**	

Note: *p < 0.05; **p < 0.01

6 Discussion and Conclusion

This section provides a summary of the research contribution by re-introducing the research questions and then summarizing the answer to each question based on the overall results of the study. The theoretical contribution of the study is discussed first, followed by managerial implications. Finally, the section concludes with a discussion on the limitations of the study and provides several suggestions for future research.

6.1 Answering the Research Questions

The main aim of this dissertation was to explore and analyze the phenomenon of digitalized companies, described as BD, through perspectives of digitalization of value-chain activities (upstream and downstream) and geographical distribution (online-offline) of the activities in foreign markets. In order to achieve this goal, an extensive study was conducted over four years. The study took into consideration the value-chain activities of BD companies to be able to understand the role of digitalization in the internationalization strategy of these companies. It also discussed the performance implications of these strategies. Thus, this dissertation is both descriptive and prescriptive in nature in that it describes the characteristics of BD companies and their strategies based on the DOD and DOI.

The following are the responses to the main questions of this thesis: BDs are service or manufacturing companies in which all core activities of the value-chain (upstream and downstream) are digitalized or coordinated by digital technologies at inception or soon after. Digitalization of the value-chain activities offers the appropriate environment to build an internationalization strategy (decision and resource implementation). Both parts of the value chain, but particularly upstream activities (e.g. creating and producing) positively influence the international performance of these companies.

The outcome of this study was in the form of four publications, each of which answered one of the sub-questions of the research. The first publication opened the way for a more detailed exploration of the topic, answering two questions: *"How are digitalized/digitalizing companies defined in IE and IM literature?"* and *"How can the DOD and DOI of digitalized/digitalizing companies be measured?"* Extant literature was investigated to define the sub-types of digitalized/digitalizing companies and find a basis for measuring their digitalization and internationalization. The study suggested that several gaps exist in the literature with regard to the definition and measurement of digitalized companies. In this publication, several propositions are made that provide the means to address the theoretical and empirical gaps in the literature, mainly related to value-chain activities (upstream and downstream) and the overall image of the phenomenon of BD companies.

The second publication was a conceptual study and also a follow-up to the first publication. It sought to answer the second research sub-question of the dissertation: *"How can BD companies be classified based on the role of digitalization of the value chain on internationalization?"* by theoretically linking the digitalization of value-chain activities (both upstream and downstream) of the firm with their international geographical distribution. The publication revealed that firms with an early digitalization of the value-chain activities translate into a stronger digital (online) presence and follow a gradual increase of resources dedicated to physical (offline) presence to increase the success of internationalization. This paper adopts an explorative approach based on the literature review and utilizes the research framework and measures proposed by Vadana et al. (2019b) and makes a conceptual analysis of digitalized/digitalizing companies to empirically classify them. Generally, it refined and further developed new researchable propositions, thereby clarifying some of the constructs that can be utilized in subsequent studies.

The third publication is qualitative and descriptive in nature, in that it described the role played by digitalized value-chain activities on international business strategy of BD companies. It addressed the third research sub-question: *"What internationalization strategy use BD companies, considering their digitalized value-chain activities (both upstream and downstream)?"* using case-study qualitative data. Both methodologically (Birkinshaw et al., 2011; Cuervo-Cazurra et al., 2016) and theoretically (Brouthers, 2013; Nambisan, 2017; Wentrup, 2016), this was a much-needed and long overdue study in the IB and IE literature. The study developed several propositions, employing the results of extant literature and discussing how BDs internationalize following different dimensions, such as market selection, market entry and modes, and development of the service or product offering (Campos et al., 2009; Hagen et al., 2012; Keupp & Gassmann, 2009). It was also argued that being constrained, BD companies tend to reuse all kinds of existing resources for different applications than those for which they were originally intended (Fisher, 2012; Man Yang, 2018). Finally, a model was made to illustrate that digitalization determines a reusage of available resources (online-offline) to solve challenges and achieve a company's goals (e.g., internationalization).

The fourth, and last, publication is more exploratory in nature and addressed the fourth research sub-question of the dissertation, *"What impact does internationalization strategy of BD companies on their international performance?"* It attempts to examine how high digitalization across value-chain activities (upstream and downstream) impacts the international performance of BD companies. The results reveal that while digital value-chain activities provide information access to customers, suppliers, and entrepreneurs as well as make a large proportion of the transactions transparent, physical value-chain activities make it possible for them to be realized by fulfilling customer orders and assembling final products and services (Bhatt & Emdad, 2001). An efficient combination of these two dimensions can enable better international performance (Crick & Crick, 2014; Hernández & Nieto, 2016; Koh & Nam, 2005; Laplume et al., 2016; L. Li et al., 2012; Wentrup, 2016).

6.2 Theoretical Contributions

Overall, this study contributes in several ways to the IB, IE and IM literature on BD companies, digitalization of value-chain activities (upstream and downstream), and internationalization strategy and international performance.

First, it contributes to the development of standard definitions, conceptualizations, and metrics, which increases research clarity within IB, IE and IM, as well as the comparability of companies across regions, countries, and specific industries. This study was conducted to close some of the gaps in the literature by analyzing both portions of value-chain activities (upstream and downstream) and their implications on internationalization strategy and international performance. Companies that are highly digitalized from their inception or soon after, defined here as BD, and a high DOD of the value chain intensively coordinate their activities using Internet infrastructure and web and mobile technologies. Both the literature review and the empirical cases suggest that the decision center is generally the home country, and the geographical and physical distance between the foreign market and home country is occasionally critical for the company's success (Luo et al., 2005; Rissanen et al., 2019; Singh & Kundu, 2002; Wentrup, 2016; Zhu & Qian, 2015). These companies are distinguished from those whose digitalized value-chain developed later (mature digital companies) and from young low-digitals and mature low-digitals that have not yet experienced a digital transformation.

In order to be able to make sense of how digitalization affects internationalization, companies were grouped, classified, and compared. This study employs a classification framework to clarify the discussion on digitalization in the context of IB, IE and IM, by examining DOD and DOI. Both the results of existing studies and this research support the fact that interaction between online and offline internationalization and DOD increases knowledge of foreign markets and users, thereby implying that digitalized companies grow more rapidly internationally, extending the dispersion of value-chain activities (Autio et al., 2000; Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016; Yamin & Sinkovics, 2006). As expected, geographical distribution of the value-chain activities and the balance between online-offline market entry modes play an important role in the international performance of both BD and low-digital companies. Further, this classification can enable researchers to identify and explain the behavior and internationalization patterns of companies with a complete or partial digitalized value-chain, in order to update the existing theories or develop new ones in IB, IE and IM, by analyzing the implication of each portion of the value chain on the internationalization strategy and international performance of BD companies.

Second, this study reveals that international strategy is influenced by the digitalization of value-chain activities. BDs combine available online factors, such as web and mobile applications and internal network (e.g., existing users), with offline organizational

activities and external networks (e.g., partners, similar companies, etc.) to achieve their goals (Vadana et al., 2019b). As it is evident in the previous section, this approach of re-using and mixing different resources (online-offline) and improvising solutions to solve existing problems and create new opportunities could be explained by the notion of bricolage (Baker & Nelson, 2005; Su, 2013).

Third, overall, the results contribute by further clarifying that high digitalization of value-chain activities positively correlates with the international success subjectively perceived by companies. However, it does not correlate with the more objective international performance factors (number of counties and international income) (Almor et al., 2014; Campos et al., 2009; Sinkovics et al., 2013). We consider this result to have several implications and underlying reasons. Importantly, it suggests that coordination of value-chain activities with digital technologies represents a unique and valuable type of competitive advantage in international markets (Abaidi & Vernette, 2018; Bell & Loane, 2010; Campos et al., 2009; Hagsten & Kotnik, 2017; L. Li et al., 2012; Zhou et al., 2007). In addition to literature, the results of this study indicate that for international BD companies, the upstream portion of the value-chain activities positively influence their international performance (both subjective and objective). In comparison, for international low-digital companies, the performance is positively influenced by the geographical distribution of the value-chain activities and size of the company.

Last, but not least, BDs may resemble born-global (Rennie, 1993) companies in different ways and can be classified as *born-global*, since digitalization enables many of them to internationalize early and rapidly, soon after their founding; however, there are a few differences. BDs can internationalize soon after inception or long after and are considered to have international activities not only because they have international revenue or because of the amount of this revenue but also because they conduct value-chain activities in foreign countries. The context of web and mobile technology may almost be taken for granted in numerous existing studies of born-global firms in high-tech industries, without an in-depth analysis of its role in value-creating activities (Koh & Nam, 2005; Wentrup, 2016) and generally ignoring the inception of this type of firm.

Finally, this study also responds to the earlier call of Nambisan (2017), Wentrup (2016), and Brouthers et al. (2016) to extend the application of digitalization to the context of value-chain activities, internationalization strategy, and international performance of BD companies. In doing so, it adopts a somewhat holistic approach by examining and classifying digitalized/digitalizing companies from both perspectives of DOD and DOI, as well as of internationalization strategy, and further applies it to the context of international performance. Specific contributions from the quantitative and qualitative parts of the study are elaborated in more detail next, as the different methodologies bring their own viewpoints and results to their corresponding research questions.

6.2.1 Contribution of the Qualitative Portion of the Thesis

The concept of *born-digital* companies explains this phenomenon through a new perspective, analyzing both portions of the value chain (upstream and downstream) activities in interaction with digitalization, which finally dictates the internationalization strategy across two dimensions: online and offline. This approach gives an idea of how to use digitalization to maximize and save resources and simultaneously to build a viable company. The study brings together several concepts (e.g., value chain, digitalization, and international strategy) that are critical for international business and international entrepreneurship; thus, this is an integrative study that helps to extend the bricolage theory by explaining the internationalization strategy of BD companies in dealing with market uncertainties, survive, and even grow despite resource constraints. The attempt to scale-up from combinations of the resources at hand (online-offline), including trust on self-taught and amateur skills that are typical of bricolage, is likely to be a slow process of trial-and- error experimentation and a very gradual accumulation of skills.

The novel business strategies employed by digital companies generate revenues from a very early stage (Bell & Loane, 2010). These companies are generally perceived as rapidly internationalizing (Bell & Loane, 2010), because of the digitalization degree integrated in their business strategy from inception (Brouthers et al., 2016; Wentrup, 2016). The BD concept is more about the high digitalization of value-chain activities at inception compared with the BG concept that is related particularly to the internationalization process.

Further, with regard to their business strategy, BD companies generally rely less on their pre-established entrepreneurial networks (and their geographical location) and more on measurable online-oriented parameters, such as the *Internet penetration rate* (Wentrup, 2016). These parameters help companies focus on the high degree of relevant data available, which are considered an adequate measurement of the market potential. The comparison reveals that the difference in internationalization can be explained by differences in the type of business strategy, which can be a topic for a future research.

6.2.2 Contribution of the Quantitative Portion of the Thesis

Earlier research suggests that companies that use the Internet as a sales channel can enhance their exports (international sales) and performance (Hagen et al., 2012; Jean et al., 2008; L. Li et al., 2012; Sinkovics et al., 2013; Zhu & Qian, 2015). This research contributes by empirically confirming how the degree of digitalization across the value chain in an internationalizing company can impact its international success, thereby also adding to the discussion on digitalization in the domains of international entrepreneurship and international business. It represents one of the first empirical studies on the role of digitalization of value-chain activities (upstream and downstream) as part of the internationalization strategy (online-offline) and its impact on the international performance of BD companies.

Digitalization determines the design for creating and capturing value in a company, thereby giving a company direction. Companies can be more efficient in utilizing user feedback and working to improve existing products or services compared with low-digital companies that generally need to invest more resources to interact with their users. BD companies are aware of their value-chain activities in real-time with less energy involved.

Further, BD companies can operate remotely from their home country for a certain time period, with most of their core functions being online (Almor et al., 2014; Sinkovics et al., 2013; Ziyae, Sajadi, & Mobaraki, 2014). Thus, this result can be explained better in relation to the size of the company and not the specific context or home country. Further, BD companies with international activities at inception or soon after generally use less-controlled modes (e.g., online—web platform or mobile app, translations, localizations, digital marketing, etc.) and, thus, they can bootstrap their business idea using digital technologies. This behavior is similar of those described as international new ventures (Oviatt & McDougall, 2005b).

Compared to the results of extent literature (Crick & Crick, 2014; Da Rocha et al., 2017; Lanzolla & Frankort, 2016; Laplume et al., 2016; L. Li et al., 2012; Ngoasong, 2017; Strange & Zucchella, 2017; Wentrup, 2016), I found no relationship between the geographical dispersion of value-chain activities (upstream-downstream) and the degree of digitalization in value-chain activities. The results reveal that the dispersion of activities is not related to digitalization of services or products but more to the economical side of businesses. BD and low-digital companies localize certain value-chain activities in foreign countries (e.g., marketing and sales, delivery, or customer support)—apart from policy, fiscal, or legal reasons—to optimize resource consumption.

6.3 Managerial Implications

The managerial implications of this research relate to informing entrepreneurs and managers regarding solutions that employ Internet hardware infrastructure, and web and mobile software technologies in their companies' IM strategies; they can use these strategies to internationalize. By focusing on the digitalization of both upstream and downstream value-chain activities, managers can identify business (and internationalization) strategies to boost the potential role of innovation and, thus, improve firm performance (C. Lee, Lee, & Pennings, 2001; Luo et al., 2005; Mahnke & Venzin, 2003; Su, 2013; Susarla et al., 2003). Integrating the strategy of digitalizing value-chain activities into marketing and business objectives could enable companies to expand their traditional boundaries and internationalize, thereby evolving into an interwoven two-tier market (i.e., physical and virtual). The more these companies use web and mobile technologies, the better they can leverage assets in foreign markets (UNCTAD, 2017).

Focusing on upstream and downstream digitalization processes of the value-chain activities, managers can identify strategies to boost innovation and increase firm performance (C. Lee et al., 2001; Luo et al., 2005; Mahnke & Venzin, 2003; Su, 2013; Susarla et al., 2003). With higher digitalization of value-chains, companies can track users and identify relevant value drivers to invest in product or service upgrading. Greater digitalization will virtually decrease the distance between companies and customers (Kollmann & Christofor, 2014). Internationalization through these processes provides companies access to different types of experiential knowledge from different sources, thereby generating a positive effect on turnover.

In addition, we observed that most of the companies we studied organize their business around online platforms; this generally transforms the logic of any industry sector, thereby making transactions between buyers and suppliers easier and more dynamic. Business strategies built on online platforms redefine the basic logic of most industries (Bell & Loane, 2010; Brouthers et al., 2016; Hänninen et al., 2017; Nambisan, 2017; Wentrup, 2016). Companies may mediate deals between buyers and suppliers rather than independently approaching the entire supply and logistics chain. They can provide value-added services such as loyalty programs, online personal customer support, and a last-mile delivery system; such services can convince customers to focus their purchases on one platform. Product or services innovation can determine the success of user adoption and, ultimately, internationalization; this can help managers adapt to business models of digitalized companies across a wide range of industries. In addition, policymakers must consider that the penetration of leading digitalized companies into their country could energize the digitalization of broader economic activities.

Wentrup (2016) claims that the company sample analyzed in his research cannot fully operate in a market without being present offline. Thus, companies are limited in terms

of how long or at what size they can operate entirely online without requiring a physical presence. The importance of offline entry also appears to increase with time (Hennart, 2014; Mahnke & Venzin, 2003; Reuber, 2016a; Wentrup, 2016). The outcomes of these studies suggests that BDs are more frequently born at home rather than born global (Hennart, 2014). Our sample did not behave differently.

Based on the model of BD or even mature digital companies, managers can consider the long-term effects of failing to commit sufficient resources to their offline presence in markets with a high psychic distance early in the internationalization process. The rapport between online and offline entry must be considered carefully by both types of companies, since online consumer preferences often differ between geographical markets. Failing to do so may affect the company's internationalization speed. Internationally expanding firms may want to retain their marketing strategy (e.g., branding) in-house because customer learning facilitated by branding is essential to prevail in foreign markets (Mahnke & Venzin, 2003).

Low-digitalized companies appear to have better opportunities when shifting to a fully digitalized value chain. The present findings may emphasize the importance of digitalization of all value-chain activities (upstream and downstream). A better understanding of digitalization opportunities in the upstream part of the value chain enables the shaping of the IM strategy accordingly, thereby improving the overall prospects of internationalization.

Overall, an appropriate implementation of web and mobile technologies and usage of the Internet can help realize benefits through building higher supply chain capabilities, achieve better R&D results to fuel new initiatives and more learning, and improve delivery and marketing activities. Early digitalization of the value chain translated into a stronger online presence, followed by a gradual increase of resources dedicated to offline presence, can represent a viable solution for the sustainable growth of low-digital companies.

6.4 Limitations and Suggestions for Future Research

This study has several limitations. The first important limitation is related to the digitalization metric (DOD) based on the company's value-chain activities (upstream and downstream). Further, the internationalization metric (DOI) proposed in this study must be tested and verified, and the lack of variance of DOI may be an important limitation in this regard.

The second limitation is related to the size of the sample that comprises only three service-oriented companies (Publication III). The sample comprises SaaS Finnish companies and

it is possible that culture, specific market-based factors, or the activity sector could influence their strategic actions. Thus, sample selection represents an important limitation. Further, a case can be made for selection bias, since the firms were selected particularly because of their home country, activity sectors, and information available online. We assume that the country of origin plays an important role in the success of company internationalization, and we suggest that future research must analyze the impact of home country on the internationalization strategy and the impact of being located in a foreign country over the same company strategy. Existing studies conclude that even companies in digitally advanced markets may have different diversification strategies. In addition, in relation to the unit of analysis, the focus of this research is company level and not entrepreneur level.

Last, but not least, an important limitation of this study includes the sample size. It was difficult to compare BD and low-digital companies, both with international activities, because the size of these two groups was very different (international BD N = 54 and international low digital N = 18). Another limitation and suggestion for future research is to ascertain how important the home country is for BD companies in their internationalization performance.

Future research must explore the corresponding themes. For example, the BD phenomenon has been analyzed based on the study of SMEs; however, the perspective on large companies with regard to value-chain structure and digitalization, country of origin, and dynamism of the industry may influence the evolution of BD companies. There may eventually be other types of BD companies or subtypes based on different criteria.

Further, it would be useful to explore issues of the speed of learning of BD companies and its impact on the relationship between internationalization process/strategy and international performance. A more thorough investigation of the differences between product and service companies could strengthen the validity of this research.

An interesting subject for future research would be to find out what hindering factors (or barriers) and key critical incidents BD companies encounter along the internationalization process/steps. Another limitation is related to the time period of sample analysis. A longitudinal approach could be relevant to further analyze in time the importance of the upstream portion of value-chain activities and the balance of online-offline entry modes used by BD companies to internationalize and optimize their performance.

Moreover, it would be interesting to identify at what point in time companies must increase their offline presence and identify the optimal balance between online and offline market entry modes. For example, can there be successful global companies with a very limited offline presence in the long run? Future research could theoretically investigate the benefits and value that combining online-offline market entry modes confers to businesses. In order to explore which portion of the value chain, upstream or downstream,

has a higher influence on the international performance of BD companies, also considering where the activities take place geographically.

In addition, further research could analyze, through quantitative methods, the relationship among the digitalization of the value chain, international strategy, and international performance—from the perspectives of companies and customers—based on the following three factors: market share growth, percentage of new product/service sales to total sales, and number of countries.

Finally yet importantly, further research should compare or combine existing internationalization theories and concepts to find potential viable research avenues to improve the understanding of the internationalization process of born-digital companies.

A worldwide shift marked by technology is changing the balance of information in favor of customers. Digital firms create this shift by collaborating with consumers to not only develop new products and services but also to enable more effective buyer interactions and optimize the customer experience (Cavusgil & Knight, 2015). Digital technologies foretell the next era of both local and international entrepreneurship. This is a time in which the traditional ways and processes of following entrepreneurial opportunities will be increasingly questioned and reworked (Nambisan, 2017). BDs represent the beginning of a new era in how internationalization will occur in the years to come.

References

Abaidi, I., & Vernette, E. (2018). Does digitalization create or reduce perceived global value? *Journal of Consumer Marketing*.

Abrahamsson, J. (2016). *Beyond Going Global - Essays on Business Development of International New Ventures Past Early Internationalization.* (Doctoral dissertation), Umeå University, Umeå: Sweden. Retrieved from Available at: http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A968749&dswid=373

Acedo, F., & Jones, M. (2007). Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms. *Journal of World Business, 42*(3), 236–252.

Addison, C. (2006). Web 2.0: A New Chapter in Development in Practice? . *Development and Practice, 16*(6), 623-627.

Akman, I., & Mishra, A. (2017). Factors influencing consumer intention in social commerce adoption. *Information Technology & People, 30*(2), 356-370.

Alcácer, J., Cantwell, J., & Piscitello, L. (2016). Internationalization in the information age: A new era for places, firms, and international business networks? *Journal of International Business Studies, 47*(5), 499-512.

Almor, T., Tarba, S. Y., & Margalit, A. (2014). Maturing, Technology-Based, Born-Global Companies: Surviving Through Mergers and Acquisitions. *Management International Review, 54*(4), 421–444.

Anderson, E., & Gatignon, H. (1986). Modes of foreign entry: A transaction cost analysis and propositions. *Journal of International Business Studies, 18*(3), 1–26.

Arenius, P., Sasi, V., & Gabrielsson, M. (2006). Rapid internationalization enabled by the Internet: The case of a knowledge intensive company. *Journal of International Entrepreneurship, 3*(4), 279-290.

Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal, 43*(5), 909–924.

Baines, T. S., Lightfoot, H. W., Benedettini, O., & Kay, J. M. (2009). The servitization of manufacturing: A review of literature and reflection on future challenges. *ournal of Manufacturing Technology Management, 20*(5), 547-567.

Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative science quarterly, 50*(3), 329-366.

Barassi, V., & Treré, E. (2012). Does Web 3.0 come after Web 2.0? Deconstructing theoretical assumptions through practice. *New Media & Society, 14*(8), 1269-1285.

Beal, V. (2017). The Difference Between the Internet and World Wide Web. https://www.webopedia.com/DidYouKnow/Internet/Web_vs_Internet.asp

Bell, J., & Loane, S. (2010). 'New-wave' global firms: Web 2.0 and SME internationalisation. *Journal of Marketing Management, 26*(3-4), 213-229.

Bell, J., McNaughton, R., Young, S., & Crick, D. (2003). Towards an integrative model of small firm internationalization. *Journal of International Entrepreneurship, 1*(4), 339-362.

Bello, D. C., & Kostova, T. (2012). Conducting high impact international business research: The role of theory. *Journal of International Business Studies, 43*(6), 537–543.

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly, 11*(3), 369-386.

Benito, G. R., Petersen, B., & Welch, L. S. (2009). Towards more realistic conceptualisations of foreign operation modes. *Journal of International Business Studies, 40*(9), 1455-1470.

Benito, G. R., & Welch, L. S. (1997). De-internationalization. *Management International Review, 37*(2), 7–25.

Benmamoun, M., Singh, N., Lehnert, K., & Lee, S. B. (2018). Internationalization of e-commerce corporations (ECCs): Advanced vs emerging markets ECCs. *Multinational Business Review, 27*(4).

Berrill, J., & Mannella, G. (2013). Are firms from developed markets more international than firms from emerging markets? *Research in International Business and Finance, 27*(1), 147-161.

Berry, M. M. J., & Brock, J. K.-U. (2004). Marketspace and the internationalization process of the small firm. *Journal of International Entrepreneurship, 2*(3), 187–216.

Bhatt, G. D., & Emdad, A. F. (2001). An analysis of the virtual value chain in electronic commerce. *Logistics Information Management, 14*(1/2), 78-85.

Birkinshaw, J., Brannen, M. Y., & Tung, R. L. (2011). From a distance and generalizable to up close and grounded: Reclaiming a place for qualitative methods in international business research. *Journal of International Business Studies, 42*(5), 573–581.

Bonaccorsi, A. (1992). On the relationship between firm size and export intensity. *Journal of International Business Studies, 23*(4), 605–635.

Brennen, S., & Kreiss, D. (2014). Digitalization and Digitization. Retrieved from Culture Digitally website: http://culturedigitally.org/2014/09/digitalization-and-digitization/

Brooksbank, R. (1991). Defining the small business: a new classification of company size. *Entrepreneurship & Regional Development, 3*(1), 17-31.

Brouthers, K. D. (2013). Institutional, cultural and transaction cost influences on entry mode choice and performance. *Journal of International Business Studies, 44*(1), 1–13.

Brouthers, K. D., Geisser, K. D., & Rothlauf, F. (2016). Explaining the internationalization of ibusiness firms. *Journal of International Business Studies, 47*(5), 513–534.

Bryman, A., & Bell, E. (2011). *Business research methods* (3rd ed.). Oxford: Oxford University Press.

Buckley, P. J. (2011). International integration and coordination inthe global factory. *Management International Review, 51*(2), 269-283.

Buckley, P. J., & Casson, M. (1976). *The future of the multinational enterprise*. London: Macmillan.

Buckley, P. J., & Ghauri, P. N. (2004). Globalisation, economic geography and the strategy of multinational enterprises. *Journal of International Business Studies, 35*(2), 81-98.

Buckley, P. J., & Strange, R. (2015). The governance of the global factory: location and control of world economic activity. *Academy of Management Executive, 29*(2), 237-249.

Bukht, R., & Heeks, R. (2018). Defining, conceptualising and measuring the digital economy. *International Organisations Research Journal, 13*(2), 143-172.

Cahen, F., & Borini, F. M. (2019). International Digital Competence. *Journal of International Management*.

Campos, H. M., del Palacio Aguirre, I., Parellada, F. S., & de la Parra, J. P. N. (2009). Technology Strategy and New Technology Based Firms. *Journal of Technology Management & Innovation, 4*(4), 42-52.

Canabal, A., & White, G. O. (2008). Entry mode research: Past and future. *International Business Review, 17*(3).

Cavusgil, S. T., & Knight, G. (2015). The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization. *Journal of International Business Studies, 46*(1), 3–16.

Cenamora, J., Rönnberg Sjödin, D., & Parida, V. (2017). Adopting a platform approach in servitization: Leveraging the value of digitalization. *International Journal of Production Economics, 192*, 54-65.

Chandra, Y., Styles, C., & Wilkinson, I. (2012). An opportunity-based view of rapid internationalization. *Journal of International Marketing, 20*(1), 74–102.

Chen, W., & Kamal, F. (2016). The impact of information and communication technology adoption on multinational firm boundary decisions. *Journal of International Business Studies, 47*(5), 563-576.

Clarqvist, B., Andersson, L., & Zwart, J.-j. (2017). *Benefits of using offline & online methods in the internationalization process: A study of e-commerce companies in Sweden.* (Master Thesis), Uppsala University, Uppsala, Sweden.

Coviello, N. E., & Jones, M. V. (2004). Methodological issues in international entrepreneurship research. *Journal of Business Venturing, 19*(4), 485-508.

Crick, D., & Crick, J. (2014). The internationalization strategies of rapidly internationalizing high-tech UK SMEs. *European Business Review, 26*(5), 421-448.

Crick, D., & Spence, M. (2005). The Internationalisation of 'High Performing' UK High-Tech SMEs: A Study of Planned and Unplanned Strategies. *International Business Review, 14*(2), 167–185.

Crotty, M. (2003). *The Foundations of Social Research: Meaning and Perspectives in the Research Process* (3rd ed.). London: Sage Publication.

Cuervo-Cazurra, A., Andersson, U., Brannen, M. Y., Nielsen, B. B., & Reuber, A. R. (2016). Can I trust your findings? Ruling out alternative explanations in international business research. *Journal of International Business Studies, 47*(8), 881–897.

Da Rocha, A., Simões, V., de Mello, R., & Carneiro, J. (2017). From global start-ups to the borderless firm: Why and how to build a worldwide value system. *Journal of International Entrepreneurship, 15*(2), 121-144.

Dimitratos, P., Johnson, J., Slow, J., & Young, S. (2003). Micro-multinationals: New Types of Firms for the Global Competitive Landscape. *European Management Journal, 21*(2), 164–174.

Dubé, L., & Paré, G. (2003). Rigor in information systems positivist case research: Current practices, trends, and recommendations. *MIS Quarterly, 27*(4), 597-635.

Durepos, G., Mills, A. J., & Weatherbee, T. G. (2012). Theorizing the past: Realism, relativism, relationalism and the reassembly of Weber. *Management and Organizational History, 7*(3), 267–281.

Easton, G. (2010). Critical realism in case study research. *Industrial Marketing Management, 39*(1), 118-128.

Edmondson, A. C., & McManus, S. E. (2007). Methodological fit in management field research. *Academy of Management Review, 32*(4), 1155–1179.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532-550.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25-32.

Fischer, E., & Reuber, R. (2014). Online entrepreneurial communication: Mitigating uncertainty and increasing differentiation via Twitter. *Journal of Business Venturing, 29*(4), 565–583.

Fisher, G. (2012). Effectuation, causation and bricolage: A behavioral comparison of emerging theories in entrepreneurship research. *Entrepreneurship Theory and Practice, 36*(5), 1019–1051.

Freeman, S., Edwards, R., & Schroder, B. (2006). How smaller born-global firms use networks and alliances to overcome constraints to rapid internationalization. *Journal of International Marketing, 14*(3), 33–63.

Freeman, S., Hutchings, K., Lazaris, M., & Zyngier, S. (2010). A model of rapid knowledge development: The smaller born-global firm. *International Business Review, 19*(1), 70–84.

Fuchs, C., Hofkirchner, W., Schafranek, M., Raffl, C., Sandoval, M., & Bichler, R. (2010). Theoretical Foundations of the Web: Cognition, Communication, and Co-Operation. Towards an Understanding of Web 1.0, 2.0, 3.0. *Future Internet, 2*, 41-59.

Gabrielsson, M., & Gabrielsson, P. (2011). Internet-based sales channel strategies of born global firms. *International Business Review, 20*(1), 88–99.

Gereffi, G., & Fernandez-Stark, K. (2011). Global Value Chain Analysis: A Primer. Durham: USA: Duke University.

Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The Governance of Global Value Chains. *Review of International Political Economy, 12*(1), 78-104.

Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of mixed methods research, 2*(1), 7-22.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). London: Sage Publications.

Hagen, B., & Zucchella, A. (2011). A longitudinal look at the international entrepreneurship dimensions: Cases and predictions. *International Journal of Management Cases, 13*(3), 484-504.

Hagen, B., Zucchella, A., Cerchiello, P., & Giovanni, N. D. (2012). International strategy and performance - Clustering strategic types of SMEs. *International Business Review, 21*(3), 369–382.

Hagsten, E., & Kotnik, P. (2017). ICT as facilitator of internationalisation in small- and medium-sized firms. *Small Business Economics, 48*(2), 431–446.

Hamill, J., Tagg, S., Stevenson, A., & Vescozi, T. (2010). Editorial. *Journal of Marketing Management, 26*(3-4), 181-186.

Hänninen, M., Smedlund, A., & Mitronen, L. (2017). Digitalization in retailing: multi-sided platforms as drivers of industry transformation. *Baltic Journal of Management, 13*(2), 152-168.

Harms, R., & Schiele, H. (2012). Antecedents and consequences of effectuation and causation in the international new venture creation process. *Journal of International Entrepreneurship, 10*(2), 95–116.

Hatch, M. J., & Yanow, D. (2003). Organization Theory as an Interpretive Science. In K. Christian & T. Haridimos (Eds.), *The Oxford handbook of organization theory* (pp. 61-87). Oxford: Oxford University Press.

Heinonen, J., Nummela, N., & Pukkinen, T. (2004). *To grow or not to grow? An analysis of internationally growth orientated Finnish SMEs?* Paper presented at the EIBA Annual Conference, Slovenia.

Hendler, J. (2009). Web 3.0 Emerging. *Computer, 42,* 111 - 113.

Hennart, J.-F. (2014). The Accidental Internationalists: A Theory of Born Globals. *Entrepreneurship Theory and Practice, 38*(1), 117–135.

Hernández, V., & Nieto, M. J. (2016). Inward-outward connections and their impact on firm growth. *International Business Review, 25*(1), 296-306.

Hernández, V., & Pedersen, T. (2017). Global value chain configuration: A review and research agenda. *Business Research Quarterly, 61*(2), 1-14.

Ifinedo, P. (2011). Internet/e-business technologies acceptance in Canada's SMEs: an exploratory investigation. *Internet Research, 21*(3), 255-281.

Ivang, R. (2008). *Towards a new understanding of the digital strategic process.* Aalborg University.

Järvensivu, T., & Törnroos, J.-Å. (2010). Case study research with moderate constructionism: Conceptualization and practical illustration. *Industrial Marketing Management, 39*(1), 100-108.

Jean, R.-J. B., Sinkovics, R., & Kim, D. (2008). Information technology and organizational performance within international business to business relationships: A review and an integrated conceptual framework. *International Marketing Review, 25*(5), 563-583.

Johanson, J., & Vahlne, J. (1977). The internationalization process of the firm—A model of knowledge development and increasing foreign commitments. *Journal of International Business Studies, 8*(1), 23–32.

Johanson, J., & Vahlne, J. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies, 40(*9), 1411–1431.

Juho, A., & Mainela, T. (2009). External facilitation in the internationalization of high-tech firms. In J. Larimo & T. Vissak (Eds.), Research on Knowledge, Innovation and InternationalizationProgress in International Business Research (Vol. 4, pp. 185 - 204): Emerald Group Publishing Limited.

Kallinikos, J., Aaltonen, A., & Marton, A. (2013). The ambivalent ontology of digital artifacts. *MIS Quarterly, 37*(2), 357–370.

Keupp, M., & Gassmann, O. (2009). The past and the future of international entrepreneurship: A review and suggestions for developing the field. *Journal of Management, 35*(3), 600–633.

Kim, D. (2003). The internationalization of US Internet portals: Does it fit the process model of internationalization? *Marketing Intelligence & Planning, 21*(1), 23-36.

Knight, G. (2000). Entrepreneurship and Marketing Strategy: The SME Under Glohalization. *Journal of Intemational Marketing, 8*(2), 12-32.

Knight, G., & Cavusgil, S. T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing, 8*, 11-26.

Knight, G., & Cavusgil, S. T. (2004). Innovation, organizational capabilities and the born-global firm. *Journal of International Business Studies, 35*(2), 124–141.

Koh, C. E., & Nam, K. (2005). Business use of the internet: A longitudinal study from a value chain perspective. *Industrial Management & Data Systems, 105*(1), 82-95.

Kollmann, T., & Christofor, J. (2014). International entrepreneurship in the network economy: Internationalization propensity and the role of entrepreneurial orientation. *Journal of International Entrepreneurship, 12*(1), 43–66.

Kraus, S., Palmer, C., Kailer, N., Kallinger, F. L., & Spitzer, J. (2019). Digital entrepreneurship: A research agenda on new business models for the twenty-first century. *Journal of Entrepreneurial Behavior & Research, 25*(2), 353-375.

Kuivalainen, O., Lindqvist, J., Saarenketo, S., & Äijö, T. (2007). International growth of Finnish software firms: starting points, pathways and outcomes. *Journal of Euromarketing, 16*(1-2), 7-22.

Kuivalainen, O., Sundqvist, S., & Servais, P. (2007). Firms' degree of born-globalness, international entrepreneurial orientation and export performance. *Journal of World Business, 42*(3), 253–267.

Kundu, S. K., & Katz, J. H. (2003). Born international SMEs: Bi-level impacts of resources and intentions. *Small Business Economics, 20*(1), 25-49.

Lanzolla, G., & Frankort, H. (2016). The Online Shadow of Offline Signals: Which Sellers Get Contacted in B2B marketplace? *Academy of Management Journal, 59*(1), 207-231.

Laplume, A., Petersen, B., & Pearce, J. (2016). Global value chains from a 3D printing perspective. *Journal of International Business Studies, 47*(5), 595-609.

Lassila, O., & Hendler, J. (2007). Embracing "Web 3.0". *IEEE Internet Computing, 11,* 90 - 93.

Lee, C., Lee, K., & Pennings, J. M. (2001). Internal capabilities, external networks, and performance: a study on technology-based ventures. *Strategic Management Journal, 22*(6-7), 615–640.

Lee, S. H., DeWester, D., & Park, S. R. (2008). Web 2.0 and Opportunities for Small Businesses. *Service Business, 2*(4), 335-345.

Lévi-Strauss, C. (1967). *The Savage Mind*. Chicago: University of Chicago Press.

Li, H., Shen, Q., & Bart, Y. (2017). Local Market Characteristics and Online-to-Offline Commerce: An Empirical Analysis of Groupon. *Management Science, 64*(4), 1860-1878.

Li, J., Merenda, M., & Venkatachalam, A. R. (2009). Business Process Digitalization and New Product Development: An Empirical Study of Small and Medium-Sized Manufacturers. *International Journal of E-Business Research, 5*(1), 49-64.

Li, L., Qian, G., & Qian, Z. (2012). The performance of small and medium-sized technology-based enterprises: Do product diversity and international diversity matter? *International Business Review, 21*(5), 941-956.

Loane, S. (2006). The role of the internet in the internationalization of small and medium sized companies. *Journal of International Entrepreneurship, 3*(4), 263–277.

Loane, S., McNaughton, R. B., & Bell, J. (2004). The Internationalization of Internet-Enabled Entrepreneurial Firms: Evidence from Europe and North America. *Canadian Journal of Administrative Sciences, 21*, 79–96.

Lowy, A., & Hood, P. (2004). *The Power of the 2x2 Matrix: Using 2x2 Thinking to Solve Business Problem and Make Better Decisions*: Jossey-Bass.

Lu, Q., & Liu, N. (2015). Effects of e-commerce channel entry in a two-echelon supply chain: A comparative analysis of single- and dual-channel distribution systems. *International Journal of Production Economics, 165*(C), 100-111.

Luo, Y., & Bu, J. (2016). How valuable is information and communication technology? A study of emerging economy enterprises. *Journal of World Business, 51*(2), 200-211.

Luo, Y., Zhao, J. H., & Du, J. (2005). The internationalization speed of e-commerce companies: an empirical analysis. *International Marketing Review, 22*(6), 693-709.

Lyytinen, K., Yoo, Y., & Boland, R. J. (2016). Digital product innovation within four classes of innovation networks. *Information Systems Journal, 26*(1), 47–75.

MacKenzie, S. B. (2003). The Dangers of Poor Construct Conceptualization. *Journal of the Academy of Marketing Science, 31*(3), 323–326.

Madsen, T., & Servais, P. (1997). The internationalization of born globals: An evolutionary process. *International Business Review, 6*(6), 561–583.

Mahadevan, B. (2000). Business models for Internet-based E-commerce: An anatomy. *California Management Review, 42*(4), 55-69.

Mahnke, V., & Venzin, M. (2003). The Internationalization Process of Digital Information Good Providers. *Management International Review, 43*(1), 115-142.

Malhotra, N. K., Agarwal, J., & Ulgado, F. M. (2003). Internationalization and Entry Modes: A Multitheoretical Framework and Research Propositions. *Journal of International Marketing, 11*(4), 1-31.

Marsh, D., & Furlong, P. (2010). A Skin Not a Sweater: Ontology and Epistemology in Political Science *Theory and Methods in Political Science* (3rd ed., pp. 184-211). UK: Palgrave Macmillan.

Martinez-Noya, A., Garcia-Canal, E., & Guillen, M. F. (2012). International R&D service outsourcing by technology-intensive firms: Whether and where? *Journal of International Management, 18*(1), 18-37.

Melén, S., & Nordman, E. R. (2009). The internationalisation modes of Born Globals: A longitudinal study. *European Management Journal, 27*(4), 243-254.

Mir, R., & Watson, A. (2000). Strategic management and the philosophy of science: The case for a constructivist methodology. *Strategic Management Journal, 21*(9), 941–953.

Moen, Ø., Endresen, I., & Gavlen, M. (2003). Use of the Internet in International Marketing: A Case Study of Small Computer Software Firms. *Journal of International Marketing, 11*(4), 129-149.

Monaghan, S., Tippmann, E., & Coviello, N. (2019). Born digitals: Thoughts on their internationalization and a research agenda. *Journal of International Business Studies*.

Musser, J., & O'Reilly, T. (2006). *Web 2.0 principles and best practices* Retrieved from http://repo.mynooblife.org/.priv8/Ebook/Web%202.0%20Principles%20and%20Best%20Practices.pdf

Nambisan, S. (2017). Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship. *Entrepreneurship Theory and Practice, 41*(6), 1029–1055.

Neely, A. (2008). Exploring the financial consequences of the servitization of manufacturing. *Operations Management Research, 1*(2), 103-118.

Ngoasong, M. Z. (2017). Digital entrepreneurship in a resource-scarce context: A focus on entrepreneurial digital competencies. *Journal of Small Business and Enterprise Development, 25*(3), 483-500.

Ni, W.-t. (2016). *Evolution Analysis of Value Chain in the Process of Manufacturing Servitization.* Paper presented at the 6th International Asia Conference on Industrial Engineering and Management Innovation

O'Reilly, T. (2004). Web 2.0 conference. conferences.oreillynet.com/presentations/web2con/intro_tim_john.ppt

O'Reilly, T. (2007). What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software. *MPRA Paper*, 17-37. http://www-public.imtbs-tsp.eu/~gibson/Teaching/Teaching-ReadingMaterial/OReilly07.pdf

OECD. (2019). Digital Innovation: Seizing Policy Opportunities. Paris: OECD Publishing.

Ofili, O. U. (2016). Internationalization: Choosing The Right Entry Mode: Lessons From Ebay's Strategy In China. *European Scientific Journal, 12*(1), 202-219.

Ojala, A., Evers, N., & Rialp, A. (2018). Extending the international new venture phenomenon to digital platform providers: a longitudinal case study. *Journal of World Business, 53*(5), 725-739.

Ojala, A., & Tyrvainen, P. (2006). Business models and market entry mode choice of small software firms. *Journal of International Entrepreneurship, 4*(2), 69–81.

Oviatt, B., & McDougall, P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies, 25*(1), 45–64.

Oviatt, B., & McDougall, P. (2005a). Defining international entrepreneurship and modeling the speed of internationalization. *Entrepreneurship Theory and Practice, 29*(5), 537–554.

Oviatt, B., & McDougall, P. (2005b). Toward a theory of international new ventures. *Journal of International Business Studies, 36*, 29–41.

Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods*. CA: Sage Publications.

Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical guide*. MA: Blackwell Publishing Ltd.

Piekkari, R., Welch, C., & Paavilainen, E. (2009). The case study as disciplinary convention: Evidence from international business journals. *Organizational Research Methods, 12*(3), 567–589.

Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance* (Vol. 1 edition): Free Press.

Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal, 12*(S2), 95-117

Porter, M. E., & Kramer, M. (2011). The Big Idea: Creating Shared Value. How to Reinvent Capitalism—and Unleash a Wave of Innovation and Growth. *Harvard Business Review, 89*(1-2), 62-77.

Porter, M. E., & Millar, V. E. (1985). How Information Gives You Competitive Advantage. *Harvard Business Review, 63*(4), 149–160.

Power, B. (2014). How GE applies lean startup practices. Retrieved from Harvard Business Review website: https://hbr.org/2014/04/how-ge-applies-lean-startup-practices

Quelch, J. A., & Klein, L. (1996). The Internet and international marketing. *Sloan Management Review, 37*(3), 60–75.

Rask, M. (2001). *Global Industriel E-handel*. Upubliceret phd-afhandling.

Rasmussen, E. S., & Tanev, S. (2015). The Emergence of the Lean Global Startup as a New Type of Firm. *Technology Innovation Management Review, 5*(11), 12-19.

Reed, M. (2005). Reflections on the 'realist tum' in organization and management studies. *Journal of Management Studies, 42*(8), 1621-1644.

Rennie, M. W. (1993). Global competitiveness: Born global. *McKinsey Quarterly, 4*, 45–52.

Reuber, R. (2016a). *Multilingualism and the internationalization of firms in digital markets*. Paper presented at the 43rd AIB-UKI, Department of Management Birkbeck, University of London, UK.

Reuber, R. (2016b). *Multilingualism and the Internationalization of New Firms in Digital Markets*. Paper presented at the AIB-UKI Conference, London.

Reuber, R., & Fischer, E. (2011). International entrepreneurship in internet-enabled markets. *Journal of Business Venturing, 26*(6), 660-679.

Rezk, R., Srai, J. S., & Williamson, P. J. (2016). The impact of product attributes and emerging technologies on firms' international configuration. *Journal of International Business Studies, 47*(5), 610-618.

Ribau, C. P., Moreira, A. C., & Raposo, M. (2018). SME internationalization research: Mapping the state of the art. *Canadian Journal of Administrative Sciences, 35*(2), 280-303.

Rissanen, T., Ermolaeva, L., Ali, A., Torkkeli, L., & Saarenketo, S. (2019). The role of home market context in business model change in internationalizing SMEs. *European Business Review*.

Roh, M., & Park, K. (2019). Adoption of O2O food delivery services in South Korea: The moderating role of moral obligation in meal preparation. *International Journal of Information Management, 47*, 262-273.

Root, F. R. (1977). *Entry strategies for foreign markets: from domestic to international business*. New York: Amacon.

Rugman, A. M., & Verbeke, A. (2004). A perspective on regional and global strategies of multinational enterprises. *Journal of International Business Studies, 35*(1), 3-18.

Sarasvathy, S. (2009). *Effectuation: Elements of entrepreneurial expertise*. Northampton, MA: Edward Elgar Publishing.

Schu, M., Morschett, D., & Swoboda, B. (2016). Internationalization Speed of Online Retailers: A Resource-Based Perspective on the Influence Factors. *Management International Review, 56*(5), 733–757.

Schwens, C., Eiche, J., & Kabst, R. (2011). The Moderating Impact of Informal Institutional Distance and Formal Institutional Risk on SME Entry Mode Choice. *Journal of Management Studies, 48*(2), 330–351.

Senyard, J., Baker, T., & Davidsson, P. (2009). Entrepreneurial bricolage: towards systematic empirical testing. *Frontiers of Entrepreneurship Research, 29*(5), 1-14.

Senyard, J., Baker, T., Steffens, P., & Davidsson, P. (2014). Bricolage as a Path to Innovativeness for Resource-Constrained New Firms. *Journal of Product Innovation Management, 31*(2), 211-230.

Shaheer, N. A., & Li, S. (2018). The CAGE around cyberspace? How digital innovations internationalize in a virtual world. *Journal of Business Venturing*.

Shankar, V., Smith, A. K., & Rangaswamy, A. (2003). Customer satisfaction and loyalty in online and offline environments. *International Journal of Research in Marketing, 20*(2), 153-175.

Singh, N., & Kundu, S. K. (2002). Explaining the Growth of E-Commerce Corporations (ECCs): An Extension and Application of the Eclectic Paradigm. *Journal of International Business Studies, 33*(4), 679-697.

Sinkovics, N., Sinkovics, R. R., & Ruey-Jer, B. J. (2013). The internet as an alternative path to internationalization? *International Marketing Review, 30*(2), 130-155.

Spence, M., & Crick, D. (2006). A comparative investigation into the internationalisation of Canadian and UK high-tech SMEs. *International Marketing Review, 23*(5), 524-548.

Stallkamp, M., & Schotter, A. P. J. (2019). Platforms without borders? The international strategies of digital platform firms. *Global Strategy Journal*.

Strange, R., & Zucchella, A. (2017). Industry 4.0, global value chains and international business. *Multinational Business Review, 25*(3), 174-184.

Styles, C., & Genua, T. (2008). The rapid internationalization of high technology firms created through the commercialization of academic research. *Journal of World Business, 43*(2), 146–157.

Su, N. (2013). Internationalization Strategies of Chinese IT Service Suppliers. *MIS Quarterly, 37*(1), 175-200.

Suddaby, R. (2006). From the editors: What grounded theory is not. *Academy of Management Journal, 49*(6), 633-642.

Susarla, A., Anitesh, B., & Whinston, A. B. (2003). Understanding the Service Component of Application Service Provision: An Empirical Analysis of Satisfaction with ASP Services. *MIS Quarterly, 27*(1), 91-123.

Tanev, S. (2017). Is There a Lean Future for Global Startups? *Technology Innovation Management Review, 7*(8), 6-15.

Tashakkori, A., & Teddlie, C. (2002). *Handbook of mixed methods in social & behavioral research*. CA: SAGE.

Thorpe, R., Robin, H., Allan, M., & Luke, P. (2005). Using knowledge within small and medium-sized firms: A systematic review of the evidence. *International Journal of Management Reviews, 7*(4), 257–281.

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidenceinformed management knowledge by means of systematic review. *British Journal of Management, 14*(3), 207–222.

Treviño, L. J., Mixon, F. G., Funk, C. A., & Inkpen, A. C. (2010). A perspective on the state of the field: International business publications in the elite journals as a measure of institutional and faculty productivity. *International Business Review, 19*(4), 378–387.

Tsoukas, H., & Knudsen, C. (2003). Introduction: The need for meta-theoretical reflection in organization theory. In K. Christian & T. Haridimos (Eds.), *The Oxford Handbook of Organization Theory* (pp. 1-36). Oxford: Oxford University Press.

UNCTAD. (2017). World Investment Report. Investment and the digital economy *Conference on trade and development*. Geneva: United Nations.

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S. (2019a). Digitalization of companies in international entrepreneurship and marketing. *International Marketing Review, 37*(3), 471-492.

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S. (2019b). Internationalization of born digital companies. In A. Chidlow, P. Ghauri, T. Buckley, A. Qamar, E. Gardner & E. Pickering (Eds.), *The Changing Strategies of International Business: How MNEs Manage in a Changing Commercial and Political Landscape*. Cham: Palgrave Macmillan.

van Hoek. (2001). E-supply chains – virtually non-existing. *Supply Chain Management, 6*(1), 21-28.

Vandermerwe, S., & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal, 6*(4), 314-324.

Watson, G., Weaven, S., Perkins, H., Sardana, D., & Palmatier, R. (2018). International Market Entry Strategies: Relational, Digital, and Hybrid Approaches. *Journal of International Marketing, 26*(1), 30-60.

Webster, F. E., Jr. (1992). The Changing Role of Marketing in the Corporation. *Journal of Marketing, 56*(4), 1–17.

Welch, C., Piekkari, R., Plakoyiannaki, E., & Paavilainen-Mäntymäki, E. (2011). Theorising from case studies: Towards a pluralist future for international business research. *Journal of International Business Studies, 42*(5), 740–762.

Wentrup, R. (2016). The online–offline balance: internationalization for Swedish online service providers. *Journal of International Entrepreneurship, 14*(4), 562–594.

Whetten, D. A. (1989). What Constitutes a Theoretical Contribution? *Academy of Management Review, 14*(4), 490–495.

Whinston, A. B., Stahl, D. O., & Choi, S. Y. (1997). *The economics of electronic commerce*. Indianapolis, IN: Macmillan Computer Publishing.

Xiao, S., & Dong, M. (2015). Hidden semi-Markov model-based reputation management system for online to offline (O2O) e-commerce markets. *Decision Support Systems, 77*, 87-99.

Yamin, M., & Sinkovics, R. R. (2006). Online internationalisation, psychic distance reduction and the virtuality trap. *International Business Review, 15*(4), 339-360.

Yang, M. (2018). International entrepreneurial marketing strategies of MNCs: Bricolage as practiced by marketing managers. *International Business Review, 27*(5), 1045-1056.

Yang, M., & Gabrielsson, P. (2018). The Interface of International Marketing and Entrepreneurship Research: Review, Synthesis, and Future Directions. *Journal of International Marketing, 26*(4), 18-37.

Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). CA: SAGE Publications.

Yin, R. K. (2013). *Case Study Research: Design and Methods* (5th ed.). CA: SAGE Publications.

Zhou, L., Wu, W., & Luo, X. (2007). Internationalization and the performance of born-global SMEs: The mediating role of social networks. *Journal of International Business Studies, 38*, 673–690.

Zhu, H., & Qian, G. (2015). High-tech firms' international acquisition performance: The influence of host country property rights protection. *International Business Review, 24*(4), 556-566.

Ziyae, B., Sajadi, S., & Mobaraki, M. (2014). The deployment and internationalization speed of e-business in the digital entrepreneurship era. *Journal of Global Entrepreneurship Research, 4*(1), 1-11.

Zou, H., Chen, X., & Ghauri, P. (2010). Antecedents and consequences of new venture growth strategy: An empirical study in China. *Asia Pacific Journal of Management, 27*(3), 393-421.

PUBLICATION I

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S.

Digitalization of companies in international entrepreneurship and marketing

Reprinted with permission from

International Marketing Review

Vol. 37, No. 3, pp. 471-492.

Digitalization of companies in international entrepreneurship and marketing

ABSTRACT

Purpose: Little research has been done on the emergence of companies that engage in increasingly digital entrepreneurship with digitalized value-chain activities. The extant literature provides an inconsistent picture of how value-chain digitalization affects companies' internationalization and international marketing, and gives no insights regarding the influence of the degree of value-chain digitalization on the level of internationalization.

Design/methodology/approach: This paper takes an explorative approach based on a literature review and uses a conceptual analysis and research framework to empirically classify digitalized/-ing companies.

Findings: This study finds ways to classify the internationalization of companies according to the degree of digitalization of their value chain. The more these companies use Internet hardware infrastructure and web and mobile software technologies, the better they can leverage their foreign assets, achieving a higher share of foreign sales with relatively limited foreign assets.

Research implications: The results enrich the literature on internationalization and international marketing and entrepreneurship to explain companies that are distinctly digitalized across their value-chain activities.

Practical implications: This research provides evidence for companies regarding digitalization of the value-chain to facilitate entrepreneurial opportunities and offer rapid, efficient, affordable internationalization.

Originality/value: This research tackles a novel phenomenon by analyzing companies' value-chain digitalization in relation to their degree of internationalization and international marketing.

Keywords: digitalization, born digital, web, mobile technologies, value chain, internationalization, international marketing

1 INTRODUCTION

The connected world and omnipresent technology have changed the rules for building brands, marketing strategies, and internationalization. While the Internet has enabled these transformations, the real drivers have been software and hardware technologies. Thanks to these changes, online customers/users *expect* simplicity (Brouthers, Geisser, & Rothlauf, 2016), convenience, and relevance (Hänninen, Smedlund, & Mitronen, 2017). This has given rise to *digital entrepreneurship*, which calls for new research approaches and explanations (Nambisan, 2017).

Research and online media indicate the emergence of a new type of companies (Bell & Loane, 2010; Brouthers et al., 2016; Wentrup, 2016) that base their business development on the latest technologies and *digitalization*[1]—the use of digital technologies to improve the business model, providing new revenue and value-producing opportunities (Hänninen et al., 2017; Nambisan, 2017). This study focuses on the literature in international marketing (IM) and international entrepreneurship (IE) to explore the types of digitalized/-ing companies[2], how to measure the degree of digitalization (DOD) and degree of internationalization (DOI), and the consequences of the interplay between digitalization and internationalization. Digitalization implies coordination of value-chain activities using Internet infrastructure and web and mobile technologies, known as *digital technologies* (Acedo & Jones, 2007; Brennen & Kreiss, 2014; J. Li, Merenda, & Venkatachalam, 2009). Broadly, however, value-chain digitalization

[1] Not to be confused with digitization, which is the process of converting any data into digits (i.e., 1s and 0s, in) (Brennen & Kreiss, 2014).

[2] Not all companies are digitalized (some engage in digitalizing their activities later), and since this is a holistic term, it may confuse readers.

describes the proportion of activities performed online (Kollmann & Christofor, 2014). Digitalization affects a number of firms' functions and activities. For example, marketing, sales, and support are key in keeping or winning new customers, and improving business decisions based on algorithms crunching big data from digital technologies is proving essential (Hänninen et al., 2017). This could help companies serve their online customers around the world.

This article enriches the knowledge on internationalization, IM, and IE by exploring value-chain digitalization. Scholars (Bell & Loane, 2010; Hamill, Tagg, Stevenson, & Vescozi, 2010) have suggested the Internet creates easy paths to internationalization for companies and offers new ways of doing business, yet little research has examined the emergence of digitalized/-ing companies (Nambisan, 2017; Wentrup, 2016), beyond online promotion and sales. A conceptual literature review is carried out to answer the following questions: *How are digitalized/-ing companies defined in the IE and IM literature? How can the DOD and DOI of these companies be measured? What are the consequences of interaction between digitalization and internationalization?*

The existing literature is explored to define, measure, and classify the internationalization of digitalized companies based on their DOD. The next section presents the literature review, which begins with a general overview of digitalized/-ing companies and continues with details about the digitalization of the value chain and the internationalization dimension of these companies. Next results are presented, and the article concludes with a discussion and implications of this study.

2 LITERATURE REVIEW

The literature suggests digitalization is more than a stimulant for companies; it is a changing context in which new technologies emerge and new capabilities are required (Nambisan, 2017; Reuber & Fischer, 2011; Wentrup, 2016). Existing research has largely neglected digital technology's role in companies' internationalization pursuits, because this subject is novel and information is lacking. Even with the vast IM and entrepreneurship literature (Abrahamsson, 2016; Knight, 2000; Moen, Endresen, & Gavlen, 2003; Quelch & Klein, 1996; Webster, 1992), questions remain regarding the conceptualization of digitalized/-ing international companies, and about internationalization processes and challenges. These questions concern international behavior, business and marketing strategies (Bell & Loane, 2010), the evolution of an online–offline balance (Wentrup, 2016), relationships between processes and resources, internationalization performance (Brouthers et al., 2016), business model particularities, and value-chain activities (Hernández & Pedersen, 2017).

The literature was investigated to define sub-types of digitalized/-ing companies and find a basis for measuring their digitalization and internationalization. Relevant articles were identified by a three-step process. First, a search was conducted for the following keywords: "portals," "web," "Internet," "online," "web-based company," "platform," "Internet-enabled," "marketplace," "high-tech," "technology companies," "software," "hardware," "digital," "digitalization," "e-marketing," "e-entrepreneurship," "e-business," "e-commerce," "mobile," "smartphone," "cyber-security," "cyberspace," "wireless," "information technology," "IT," or "ICT," combined with "internationalization," "international," "market entry modes," "foreign markets selection," "international performance," global," "foreign," "cross-national," "cross-cultural," "export," or "import." These combinations were sought in titles and abstracts of

articles published after 2000 in the top IM, IE, and IT journals, including the *Journal of International Marketing*, *International Marketing Review*, *Journal of Marketing*, *Journal of Marketing Research*, *Journal of the Academy of Marketing Science*, *Journal of International Business Studies*, *Journal of World Business*, *Global Strategy Journal*, *Management and Organization Review*, *International Business Review*, *Journal of Business Venturing*, *Entrepreneurship Theory and Practice*, *Information and Management*, *Management Information Systems Quarterly*, and *Internet Research.* The Web of Science and Science Direct databases were used to identify other relevant papers, as were the reference sections of the articles found through the search steps above. The search criteria yielded 94 sources.

Second, the five criteria of Rialp, Rialp, and Knight (2005) were adopted to refine the number of articles for review. Articles had to be published in English; in 2000–2018; conceptual, theoretical or empirical academic papers; closely related to the topic under discussion; and major works systematically listed as key references in other studies with a similar focus. The 2000–2018 time frame was selected because the concept of digitalization is young, and most related works have been published since 2000. It was assumed that any relevant research from the 20th century is cited in the analyzed studies. These selection criteria yielded 45 sources.

In the last layer of selection, 35 articles were identified as covering the topic of internationalization of digitalized/-ing companies. The excluded papers are review articles or generally conceptual, focusing not on companies but on theoretical constructs. The review highlighted the lack of information and prior academic research available on this topic in the IM, IE, and information technology fields.

3 DESCRIPTIVE OVERVIEW AND CONCEPTUAL ANALYSIS

All the analyzed sources focus on defining and investigating digitalization (see Tables 1 and 2).

Insert Table 1 about here

Insert Table 2 about here

Technology-based companies are characterized by their proprietary, innovative technologies, and might initially seem different from digitalized companies, characterized by using Internet networks and web and mobile technologies as key drivers of business development and rapid internationalization. However, technology-based companies also use the Internet to coordinate their value-chain activities and internationalization processes (Nambisan, 2017; Wentrup, 2016). Two dimensions—DOD and DOI—were used to outline these types of companies in comparison with less digital ones.

3.1 DOI of digitalized/-ing companies

As Table 2 illustrates, most of the measurements in the existing literature referring to digitalized/-ing companies' internationalization focus on linguistic and cultural similarities (Brouthers et al., 2016; Hennart, 2014; Kim, 2003; Mahnke & Venzin, 2003; Reuber, 2016; Reuber & Fischer, 2011), adaptation versus standardization (L. Li, Qian, & Qian, 2012), the business model (Hänninen et al., 2017), internationalization speed (Hennart, 2014), online

networks (Brouthers et al., 2016), market knowledge (Luo, Zhao, & Du, 2005), or online–offline presence (Wentrup, 2016). These companies all generate value using the Internet; however, the literature suggests their internationalization processes may differ (Bell & Loane, 2010; Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016).

Digitalization makes companies less physically and culturally constrained compared to traditional businesses (Luo et al., 2005). Nevertheless, the type of company analyzed by Wentrup (2016) follows a more near-market, gradual geographical pattern in its internationalization process, starting with the Nordic markets and expanding to nearby European markets. It has been argued that these companies prefer to enter international markets via controlled modes (e.g., subsidiaries; (Reuber, 2016; Sinkovics, Sinkovics, & Ruey-Jer, 2013); sometimes digital companies cannot enter and be active in a market without an offline presence due to legal and market-specific requirements (Wentrup, 2016). There is likely a limit, therefore, on how long, or up to what size, a digital company can operate online without a physical presence.

Zhu and Qian (2015) argue that good digital information providers enter foreign markets with a well-developed Internet infrastructure as the availability and costs of such services influence success (Mahnke & Venzin, 2003); see Table 2). Luo et al. (2005) indicate that a country in which a large percentage of the population uses the web and mobile technologies presents a more attractive market for e-commerce companies.

Competition is another driver of swift international expansion among online service providers (see Table 2; (Singh & Kundu, 2002; Su, 2013). The first-mover advantage is often stressed

(Kim, 2003; Knight & Cavusgil, 1996; Oviatt & McDougall, 1994; Wentrup, 2016; Yamin & Sinkovics, 2006). Another important catalyst of digital companies' rapid internationalization is related to niche markets. Companies that sell niche products and services internationalize more quickly (Hennart, 2014; Nummela, Saarenketo, & Puumalainen, 2004; Zucchella, Palamara, & Denicolai, 2007). In international expansion, a company develops its domestic markets across international borders by integrating operations formerly carried out by intermediate product markets (Buckley & Casson, 1976; Rugman, 1980). The literature has tried to capture the phenomenon of digitalized companies' internationalization, although the overview is still incomplete.

To the best of the authors' knowledge (see Table 3), research focuses much more on companies' outward internationalization (e.g., delivery, marketing and sales, support) of the value chain (Bell & Loane, 2010; Brouthers et al., 2016; Crick & Spence, 2005; L. Li et al., 2012; Wentrup, 2016; Zou, Chen, & Ghauri, 2010) and less on inward internationalization activities (e.g., creating, producing; (Abrahamsson, 2016; Campos, del Palacio Aguirre, Parellada, & de la Parra, 2009; Luo et al., 2005; Singh & Kundu, 2002). Although marketing and sales are often core elements of early internationalization, this focus on outward internationalization offers only a partial image of these companies' functions and strategies.

Table 3. Papers focusing on inward versus outward internationalization regarding the value chain.

Inward internationalization	Outward internationalization	
Mahnke & Venzin, 2003	Brouthers et al., 2016	Stallkamp & Schotter, 2019
Luo et al., 2005	Zhu & Qian, 2015	Javalgi, Todd, Johnston, & Granot, 2012
Campos et al., 2009	Li et al., 2012	**Luo & Bu, 2016**
Almor, Tarba, & Margalit, 2014	**Mahnke & Venzin, 2003**	**Chen & Kamal, 2016**
Singh & Kundu, 2002	**Luo et al., 2005**	Hagsten & Kotnik, 2017
Ojala & Tyrvainen, 2006	Crick & Spence, 2005	Watson et al., 2018
Luo & Bu, 2016	Bell & Loane, 2010	Shaheer & Li, 2018

Chen & Kamal, 2016 Rezk, Srai, & Williamson, 2016 **Ojala, Evers, & Rialp, 2018** Martinez-Noya et al., 2012	**Almor, Tarba, & Margalit, 2014** Kim, 2003 Hennart, 2014 Reuber, 2016 Wentrup, 2016 Mahadevan, 2000 Hänninen et al., 2017 Susarla, Anitesh, & Whinston, 2003 Su, 2013 **Ojala & Tyrvainen, 2006** Styles & Genua, 2008 Juho & Mainela, 2009	**Ojala, Evers, & Rialp, 2018** Caniëls et al., 2015 Gabrielsson & Gabrielsson, 2011 Ifinedo, 2011

The bolded references focus on both parts of the value-chain activities

3.2 DOD of digitalized/-ing companies

Studies use different terms like *e-business* (Brouthers et al., 2016), *high-tech companies* (Almor, Tarba, & Margalit, 2014; Crick & Spence, 2005; Juho & Mainela, 2009; L. Li et al., 2012; Ojala & Tyrvainen, 2006; Styles & Genua, 2008; Su, 2013; Zhu & Qian, 2015), *digital information goods providers* (Mahnke & Venzin, 2003; Wentrup, 2016), *new technology-based companies* (Bell & Loane, 2010; Campos et al., 2009; Mahadevan, 2000; Reuber, 2016), *accidental internationalists* (Hennart, 2014), or *application service providers* (Susarla, Anitesh, & Whinston, 2003). Broadly, however, they view a digitalized company as any firm that provides its products and services to customers using the Internet and other technologies (Bell & Loane, 2010; Nambisan, 2017; Wentrup, 2016). The extant literature suggests that Internet infrastructure and web and mobile technologies represent more than a catalyst for IE and IM; new phenomena are developing and new capabilities are needed in the international environment (Reuber, 2016). It is has become much easier to create links between most industries and customers based on web platforms enhanced by e-commerce solutions (Wentrup, 2016).

Digitalized companies are commonly expected to sell digital products for which they do not require IM adaptation. The anticipated dynamic is the higher the DOD (Jean, Sinkovics, & Kim, 2008), the lower the need for product and service adaptation. Yet the international performance of even digitalized companies depends on adaptation, enhanced by specific marketing strategies and communication languages and channels (Luo et al., 2005; Moen et al., 2003; Moen, Gavlen, & Endresen, 2004; Reuber & Fischer, 2011). Although differentiation and customization lead to a smaller market served at one time (Reuber, 2016), to be successful in foreign markets, digitalized companies' marketing strategies and capabilities also focus on adaptation and encouraging customers' involvement in improving their products (Knight, 2000; Luo et al., 2005; Moen, Koed Madsen, & Aspelund, 2008).

Brouthers et al. (2016) suggest that digitalization of companies augments their value chain through *servitization* (Vandermerwe & Rada, 1988), adding service capabilities and solutions to supplement their product offerings (Baines, Lightfoot, Benedettini, & Kay, 2009; Neely, 2008; Vandermerwe & Rada, 1988). For example, even online retailers requiring physical distribution of their products increasingly internationalize more rapidly than brick-and-mortar retailers do (Schu, Morschett, & Swoboda, 2016).

Nambisan (2017) describes digital entrepreneurship through digital artifacts, platforms, and infrastructure. Digital artifacts present digital applications or online content as part of a new product (or service) offering a specific functionality or value to the end user. Digital platforms serve as a shared set of services and architecture that hosts complementary offerings. Digital infrastructure comprises systems that provide better communication, collaboration, or computing capabilities. If these characteristics are relied on to describe digitalized companies,

however, important aspects captured by value-chain activities—which cover the full range of companies' activities to bring products or services from conception to end use and beyond—might be missed. Companies gain competitive advantage from how they configure the five main parts of the value chain (i.e., creating, producing, marketing and selling, delivering, and supporting products or services; (Porter & Kramer, 2011); also see Table 4).

Table 4. Examples of digitalized value-chain activities.

Creating	Producing	Marketing and selling	Delivering	Supporting
Research and development based on technology and behavioral data	Online platform/website (web and/or mobile)	Online payment system; marketing based on social media, analytics	Online delivery/last-mile delivery service	Online customer care

Source: Literature review papers (n = 35) and example companies.

Already, web technologies have made product and service information ubiquitous; social media drives consumers to share, compare, and rate experiences; and mobile devices add a "wherever" dimension to the digital environment. To win over customers, companies must know them and their expectations, and must be able to reach customers with the right kind of interaction. Marketing based on social media and analytics is key to building that understanding—data to define and contextualize trends, to measure the effectiveness of activities and investments at key points in the consumer decision journey, and to understand how and why individuals move along those journeys (Bell & Loane, 2010; Brouthers et al., 2016; Javalgi, Todd, Johnston, & Granot, 2012; Kim, 2003; Luo et al., 2005; Mahnke & Venzin, 2003; Singh & Kundu, 2002).

Management literature uses the terms *global value chain* (Gereffi & Fernandez-Stark, 2011; Hernández & Pedersen, 2017) and *global factory* (Buckley, 2011; Buckley & Ghauri, 2004) to

describe the situation where some of a company's activities are located in other countries. This paper refers to the *value chain* as defined by Porter (1985).[3] In the analyzed literature, the most frequent metrics for assessing the digitalization of value-chain activities relate to marketing, sales and support. Market performance plays an important role, but this neglects most parts of the value chain (see Table 3). Thus, too little is known about other modes and value-chain internationalization (Mudambi & Zahra, 2007).

4 RESEARCH FRAMEWORK

Based on the literature review a conceptual research framework was used to classify digitalized/-ing companies based on the relationship between age of the company (young vs. mature), DOD (domestic vs. international) and DOI (high vs. low). Following Lowy and Hood (2004), the framework was built using a 2 × 2 matrix. In addition, classification was used as a tool to find the main patterns among these companies.

Classification was carried out using three dimensions (see Figure 1):

- Age of the company (Crick & Spence, 2005; Hennart, 2014; Kim, 2003; Luo et al., 2005);
- DOD of its value chain, inward (Almor et al., 2014; Campos et al., 2009; Mahnke & Venzin, 2003) and outward (Brouthers et al., 2016; Hänninen et al., 2017; Wentrup, 2016); and

[3] "Value chain is a system of interdependent activities" (p. 48).

- DOI of the online–offline geographical dispersion of its value-chain activities in foreign markets (Nambisan, 2017; Reuber & Fischer, 2011; Sinkovics et al., 2013; Wentrup, 2016).

In Figure 1, the horizontal axis captures the time and internationalization dimension (age of the company; domestic/international); the vertical axis captures the DOD of the value-chain activities (high/low). Thus, enterprises in the first quadrant can be referred to as *born-digital* (BD) companies: companies in which most of the value chain is highly digitalized at inception, or soon after. In general, they are characterized by their easier approach to accessing foreign markets compared to low-tech companies—a consequence that makes it necessary to shed light on the IM and entrepreneurship activities of BD companies as well.

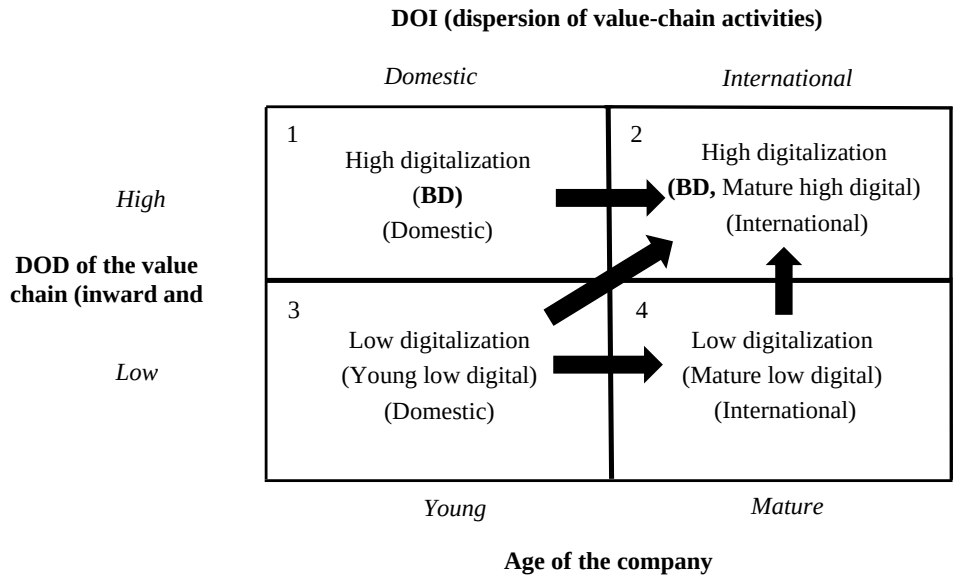
The digitalized value-chain activities that represent DOD—defined by "high digitalization"—differ according to the core product's nature. To avoid considering all companies founded in the Internet era as BD, based only (for example) on the use of email as an Internet communication tool, it is assumed that BD companies should have highly digitalized most parts[4] of their value chain straight from their inception, or soon after (Figure 1).

The second quadrant in Figure 1 includes BD companies and those with a highly digitalized value chain that experienced the transformation later in time ("mature digital" companies). The third and fourth quadrants comprise companies with a low-digitalized value chain, defined by age as "young low digital" and "mature low digital," respectively.[5]

[4] This is an arbitrary criterion, but it helps distinguish between software companies with digital products and those with tangible products.

[5] The authors thank an anonymous reviewer for the suggestion to add terms denoting firms that are not BD.

Figure 1. Classification of digitalized/-ing companies based on degree of digitalization (DOD) and degree of internationalization (DOI). BD: born-digital.



After analyzing metrics in the existing literature, the internationalization perspective was measured in terms of dispersion of value-chain activities online (e.g., development, website translation/localization, online sales/support) and offline (e.g., delivery, global offices, on-site support; (Reuber, 2016; Sinkovics et al., 2013; Wentrup, 2016). Moreover, to measure value-chain digitalization, the inward (Almor et al., 2014; Campos et al., 2009; Mahnke & Venzin, 2003) and outward (Brouthers et al., 2016; Hänninen et al., 2017; Wentrup, 2016) metrics from the literature were used.

This framework identifies specific types of companies in each quadrant of the matrix. In time, by updating their DOI and DOD, companies can change quadrants. In the first quadrant of Figure 1, not all companies are BD and not all BD companies are international; however, the focus is on those companies that follow an international path, toward the second quadrant. BD

companies can become internationally operating high-digital companies when they move from quadrant 1 to quadrant 2; “young low digitals” become internationally operating low-digital companies when they move from quadrant 3 to quadrant 4, but they can also become “mature high digital” by moving, over time, to quadrant 2.

The main differences between types of companies in Figure 1 are the DOD of the value chain (high vs. low), and the DOI—the online–offline geographical dispersion of activities, domestically and internationally. The horizontal axis measures the number of countries in which these companies have value-chain activities, offline (i.e., with offices) and online, based on the number of localized websites or domains in a country’s official language. The first two quadrants therefore comprise BD companies, and the other two represent companies in different stages of digitalization, with domestic or international activities. The arrows emphasize the processes of digitalization and internationalization of the company types in quadrants 1, 3, and 4.

An absolute online presence can be surmised at one extreme point, meaning all value-chain activities are run on Internet infrastructure and coordinated by web and mobile technologies. Companies in this category operate almost entirely in a virtual setting. At the other extreme, a purely offline presence means only physical resources are present (Wentrup, 2016). In practice, degrees of online and offline presence may vary over time (Sinkovics et al., 2013). Clear evidence of a balance between online and offline activities is provided by the type of resource involved in the two domains (Wentrup, 2016). In terms of selling and marketing value-chain activity, online entry may be nearly instantaneous if a product or service is available online in a specific market. While an offline entry may be more gradual and time-consuming, the

necessity of entry seems to increase with time (Wentrup, 2016). The efficiency of the internationalization strategy allows such ventures to “bootstrap” into international markets.

Five companies—Avito.ru, Farfetch, HelvetiBox, HelloFresh, and IKEA—were chosen to illustrate the different types of companies distinguished by the number of value-chain activities enabled by web and mobile technologies and the number of countries in which any value-chain activities occur.

As Figure 2 shows, more digitalization increases the dispersion of geographic activities (online and offline) around the world. Not all BD companies, however, operate internationally. The companies in the first two quadrants display similar digitalization. The most important difference between them is the number of activities in foreign markets. When digitalization is

Figure 2. Classification of digitalized/-ing companies based on degree of digitalization (DOD) and degree of internationalization (DOI).

DOI (dispersion of value-chain activities)

DOD of the value chain (inward and outward)	*Domestic*	*International*
High	1 **Avito.ru** (**BD**) (Domestic)	2 **Farfetch**, IKEA (**BD**, mature high digital) (International)
Low	3 HelvetiBox (Young low digital) (Domestic)	4 HelloFresh (Mature low digital) (International)
	Young	*Mature*

Age of the company

used for coordinating value-chain activities, BD companies can expand faster internationally than those with a less-digitalized value chain.

Avito.ru, an online classified ad platform, is a BD company having a highly digital value chain since its inception. It is a technology company providing an e-commerce platform (i.e., core business) with classified ads and online shops. Its platforms include an online payment system, and it uses online marketing campaigns based on data generated by its users. Most of its services can be delivered from headquarters (Weaver, 2011).

Farfetch is a British international fashion marketplace that uses an online e-commerce platform to sell clothes made by designers from around the world. Rather than having a warehouse, Farfetch acts as an online matchmaker between customers and brands. Brands can create an e-shop on Farfetch's main site or use the company's technology to power their online store. It gives access to brands from 25 countries and has customers in over 170 markets (Strugatz, 2014). Using social media platforms, analytics scripts, and mobile apps, Farfetch collects and analyzes user information to create an individualized marketing strategy for each customer, enabling prediction of each customer's future demands. This ability allows the company to send automatically optimized email and online campaigns to each user. The company's business strategy is fueled by its customer service, on-time delivery system, and advantageous returns and refunds policy (Lewis, 2016).

HelloFresh is a provider of fresh food at home. It has headquarters in Berlin and operations in 11 markets across three continents. HelloFresh generates revenue from the sale of recipe boxes, which varies depending on the frequency of meals and number of people per meal. Each week,

customers choose their meal plan and select a delivery day. Other than the website (i.e., marketing, sales and support), this company performs value-chain activities (i.e., supplier partnerships, logistics, storage, delivery) offline. HelloFresh has a web-based business model (i.e., an online platform), but exemplifies a mature low-digital company, with international activities since 2012 (Helm, 2018).

HelvetiBox is a service founded in 2015 in Cordast, Switzerland. Customers use the HelvetiBox website to order 5–8 Swiss-made specialty foods per month. Despite the website (i.e., marketing, sales and support), most value-chain activities (e.g., logistics, supplier partnerships, storage, delivery) are conducted offline. This is a clear example of a young web-based company (i.e., an online platform), with a low-digitalized value chain and domestic activities, but with the potential to go international and increase the digitalization of its value chain (HelvetiBox, 2017).

IKEA is one of the biggest furniture companies in the world, founded in Älmhult, Sweden, in 1943. As its internationalization process took more time and resources, IKEA adopted digitalization of the value chain more than a decade ago, enhancing their initial brick-and-mortar business model. This example of a mature high-digital company combines online (e-shop) with offline (store) into an omnichannel concept covering a large scale of customers (Jonsson & Foss, 2011).

Depending on the industry, tangible foreign assets in international markets are still used, but are often defined by business offices or data centers (UNCTAD, 2017), needed more for policy issues or customer support. Overall, the firm cases show that early digitalization of the value

chain, translated into a stronger online presence, followed by a gradual increase in resources dedicated to offline presence, may present one solution for BD companies' sustainable growth.

5 DISCUSSION

This exploratory study focused on testing metrics selected from the literature review, and the proposed research frameworks. Few studies have attempted to analyze companies from these perspectives, and the IE and IM literature on digitalization is still in its nascent stages. This paper reviewed the current concepts describing different types of digitalized/-ing enterprises (Nambisan, 2017; Wentrup, 2016), mostly focusing on BD. Suitable metrics were identified for developing an empirical classification of low- and high-digital companies by analyzing several theoretical research models in the existing literature. Developing standard definitions, conceptualizations, and metrics increases research clarity, as well as the comparability of companies across regions, countries, and specific industries. This work was carried out to close some of the gaps in the literature.

Digitalization forms distinct types of companies (international or not) for many reasons, but especially due to the business model. Companies that are highly digitalized from their inception, or soon after, defined here as BD, using a high DOD of the value chain, intensively coordinate their activities using Internet infrastructure and web and mobile technologies. Both the literature review and the empirical cases suggest the decision center is generally the home country, and the geographical and psychic distance between the foreign market and home country is sometimes critical for the company's success (e.g. in line with all analyzed cases, and in) (Luo et al., 2005; Rissanen, Ermolaeva, Ali, Torkkeli, & Saarenketo, 2019; Singh & Kundu, 2002; Wentrup, 2016; Zhu & Qian, 2015). These companies are distinguished from those whose

highly digitalized value chain developed later in time (mature digital companies), and by young low digitals and mature low digitals, that have not yet experienced a digital transformation.

Research suggests some internationally operating BD companies may represent a subset of born-global companies (i.e., companies that internationalize early and rapidly); based on Hennart's (2014) work, one can expect BD companies' behavior to be determined largely by their business models, which generate revenues from an early stage (Ojala & Tyrvainen, 2006; Su, 2013). These companies are generally perceived as rapidly internationalizing (Bell & Loane, 2010), because of the high DOD of their value chain from the beginning (Brouthers et al., 2016; Wentrup, 2016). This could be a topic for further empirical research.

5.1 Theoretical implications

This study explored the digitalization phenomenon, analyzing several metrics in the extant literature. It concludes by recommending a framework that relies on the relevance of digitalized value-chain activities and IM, using both online and offline dimensions of the geographical distribution of value-chain activities, to present a conceptual analysis of the characteristics and metrics of companies' digitalization, mostly focusing on BD. Most metrics found in the analyzed literature do not fit the particularities of digitalized/-ing companies; therefore, a new set of metrics and a model are proposed to classify them.

Most papers included in the literature review use web-based technologies to measure the digitalization of value-chain activities (Bell & Loane, 2010; Brouthers et al., 2016; Hänninen et al., 2017; Hennart, 2014; Kim, 2003; Luo et al., 2005; Mahnke & Venzin, 2003; Reuber, 2016; Wentrup, 2016). Thus, BD companies are service or product companies in which most

of the value chain is highly digitalized; further, they either experienced that transformation soon after inception or did not need to transform. Mature digital companies, in contrast, entered this process long after inception and have a brick-and-mortar business strategy, combining offline with online activities. Still others (mature low-digital and young low-digital companies) have not finished or have only begun digital transformation; their value-chain activities rely more on offline functions, and their internationalization process is slower because their speed of learning is lower (Autio, Sapienza, & Almeida, 2000; Hennart, 2014; Sinkovics et al., 2013).

The digitalized activities that show DOD differ mainly in relation to product nature. If the product is tangible, a higher DOD is reached when production and distribution are coordinated with Internet technologies. Servitization also helps tangible products attain a high DOD. Baines et al. (2009) and Neely (2008) argue servitization offers significant potential value, providing solutions for companies to update their value chain and reap greater benefits by creating more complex and refined products and services.

Digitalized companies must have most parts of the value chain digitalized, or at least enhanced or coordinated by Internet infrastructure and web and mobile technologies. Internationalization occurs largely because of the digital nature of the value-chain activities. The framework indicates that empirical investigators interested in digitalized companies, especially BD companies, will find larger sample sizes in industries with a highly developed Internet infrastructure (Mahadevan, 2000; Susarla et al., 2003; Wentrup, 2016). The framework also distinguishes companies by domestic versus international activity; however, empirical research is needed to better understand the correlation between the value chain and internationalization. Digitalization is presumed to increase internationalization. There are IM-related issues (e.g.,

barriers of entry) based on liability of foreignness and newness (Hymer, 1976; Zaheer, 2002), and digitalized companies must overcome numerous marketing challenges to motivate customers to find, trust, and purchase their offerings (Rangan & Adner, 2001; Yamin & Sinkovics, 2006).

Furthermore, the international performance of digitalized companies depends on product or service adaptation (Luo et al., 2005; Moen et al., 2003; Moen et al., 2004; Reuber & Fischer, 2011) correlated with a marketing strategy focused on customers' or users' involvement (Knight, 2000; Luo et al., 2005; Moen et al., 2008). These companies often offer their products or services first for a niche market; they adapt quickly to control that market, and after may become mainstream. Digitalization of outward value-chain activities like marketing, sales and support tends to increase the international performance of inward activities, especially improving R&D by driving innovation based on customers' input and behavioral data (Almor et al., 2014; Crick & Spence, 2005; Hennart, 2014; Luo et al., 2005; Mahnke & Venzin, 2003).

This study employs a holistic framework to clarify the discussion on digitalization in the context of IE and IM. It integrates the new concept of BD, which explains the digitalization phenomenon through an innovative perspective, analyzing the digital value-chain activities correlated with internationalization across two dimensions—online and offline. According to the literature, the interplay between online and offline internationalization and DOD increases knowledge of foreign markets and users, meaning digitalized companies grow more rapidly internationally, extending the dispersion of value-chain activities (Autio et al., 2000; Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016; Yamin & Sinkovics, 2006). Going forward, this

classification will help in developing new theories by analyzing digitalized/-ing companies' internationalization patterns and strategies.

5.2 Managerial and policy implications

The managerial implications of this research relate to informing entrepreneurs and managers about solutions employing Internet hardware infrastructure and web and mobile software technologies in their companies' IM strategies; they can use these strategies to internationalize. Integrating the strategy of digitalizing value-chain activities into marketing and business objectives could help companies expand their traditional boundaries and internationalize, evolving into an interwoven two-tier market (i.e., physical and virtual). The more these companies use web and mobile technologies, the better they can leverage assets in foreign markets (UNCTAD, 2017).

Focusing on digitalization of inward and outward processes and value-chain activities, managers can identify IM strategies to boost innovation and increase firm performance (Lee, Lee, & Pennings, 2001; Luo et al., 2005; Mahnke & Venzin, 2003; Su, 2013; Susarla et al., 2003). With higher digitalization of value chains, companies can track users and identify relevant value drivers to invest in product or service upgrading. Greater digitalization will virtually decrease the distance between companies and customers (Kollmann & Christofor, 2014). Internationalization through these processes will give companies access to different types of experiential knowledge from different sources, generating a positive effect on turnover.

Based on the model of BD or even mature digital companies, managers can consider the long-term effects of failing to commit sufficient resources to their offline presence in markets with a

high psychic distance early in the internationalization process. The rapport between online and offline entry should be considered carefully by both types of companies since online consumer preferences often differ between geographical markets. Failing to do so may affect the company's internationalization speed. Internationally expanding firms may want to keep their marketing strategy (e.g., branding) in-house because customer learning facilitated by branding is essential to prevail in foreign markets (Mahnke & Venzin, 2003).

The internationalization success of digitalized companies relates to the value generated by providing an online platform, organizing the marketing strategy for user adoption, and managing users' cross-relationships. Business models built on online platforms redefine the basic logic of most industries (Bell & Loane, 2010; Brouthers et al., 2016; Hänninen et al., 2017; Nambisan, 2017; Wentrup, 2016). Companies may mediate deals between buyers and suppliers rather than approaching the whole supply and logistics chain independently. Business model innovation determines the success of user adoption and, ultimately, internationalization; this can help managers adapt to business models of digitalized companies across a wide range of industries. In addition, policymakers must consider that the penetration of leading digitalized companies into their country will energize the digitalization of broader economic activities.

Low-digitalized companies seem to have better opportunities when shifting to a fully digitalized value chain. The present findings may underline the importance of digitalization of all value-chain activities (inward and outward). A better understanding of digitalization opportunities in the upstream part of the value chain allows shaping the IM strategy accordingly, improving the overall prospects of internationalization.

6 LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. First, it focused on new theoretical conceptualizations and empirical findings regarding the internationalization of digitalized companies. Considering the novelty of the research topic, the available information is limited. As is the case in international new venture and born-global studies, studies on digitalization focus too much on high-tech industries (Andersson, Evers, & Kuivalainen, 2014), and little is known about other industries' digitalization efforts. Another potential limitation could be the digitalization metric based on the company's value chain. Most activities are Internet related, and it can be difficult to track where in their value chains companies have their activities. Furthermore, the internationalization metrics proposed in this study must be tested and verified, and the lack of variance of DOI may be an important limitation.

Future research should explore the corresponding themes. For instance, the BD phenomenon has been analyzed thoroughly based on the study of large companies; however, other perspectives are needed on how the value-chain structure, digitalization, country of origin, and dynamism of the industry may influence the evolution of BD companies. There may eventually be other typologies of BD companies or subcategories based on different criteria.

It would be useful to explore issues such as the role of value-chain digitalization in internationalization; the impact of high digitalization of value-chain activities on internationalization strategy and international performance; or the speed of learning of BD companies and its impact on the relation between internationalization process/strategy and international performance.

The internationalization process includes multiple steps. In general, companies' inward–outward activities are initially related to geography; they begin with regional expansion, balancing the resources invested in their online and offline presence to expand to new international markets. There may be a significant difference between an information and communication technology (ICT)-based firm and an ICT-intensive one. A more thorough investigation of the differences between product and service companies could strengthen the validity of this paper.

Digital technologies foreshadow the next era in IM and IE. The traditional means of following marketing and entrepreneurial opportunities will be increasingly questioned and reworked. BD companies represent the beginning of this new era in how internationalization will be achieved.

7 REFERENCES

Abrahamsson, J. (2016). *Beyond Going Global - Essays on Business Development of International New Ventures Past Early Internationalization.* (Doctoral dissertation), Umeå University, Sweden. Retrieved from Available at: http://urn:nbn:se:umu:diva-125469

Acedo, F., & Jones, M. (2007). Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms. *Journal of World Business, 42*(3), 236–252.

Almor, T., Tarba, S. Y., & Margalit, A. (2014). Maturing, Technology-Based, Born-Global Companies: Surviving Through Mergers and Acquisitions. *Management International Review, 54*(4), 421–444.

Andersson, S., Evers, N., & Kuivalainen, O. (2014). International new ventures: rapid internationalization across different industry contexts. *European Business Review, 26*(5), 390-405.

Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of Management Journal, 43*, 909–924.

Baines, T. S., Lightfoot, H. W., Benedettini, O., & Kay, J. M. (2009). The servitization of manufacturing: A review of literature and reflection on future challenges. *ournal of Manufacturing Technology Management, 20*(5), 547-567.

Bell, J., & Loane, S. (2010). 'New-wave' global firms: Web 2.0 and SME internationalisation. *Journal of Marketing Management, 26*(3-4), 213-229.

Brennen, S., & Kreiss, D. (2014). Digitalization and Digitization. Retrieved from Culture Digitally website: http://culturedigitally.org/2014/09/digitalization-and-digitization/

Brouthers, K. D., Geisser, K. D., & Rothlauf, F. (2016). Explaining the internationalization of ibusiness firms. *Journal of International Business Studies, 47*(5), 513–534.

Buckley, P. J. (2011). International integration and coordination inthe global factory. *Management International Review, 51*(2), 269-283.

Buckley, P. J., & Casson, M. (1976). *The future of the multinational enterprise*. London: Macmillan.

Buckley, P. J., & Ghauri, P. N. (2004). Globalisation, economic geography and the strategy of multinational enterprises. *Journal of International Business Studies, 35*(2), 81-98.

Campos, H. M., del Palacio Aguirre, I., Parellada, F. S., & de la Parra, J. P. N. (2009). Technology Strategy and New Technology Based Firms. *Journal of Technology Management & Innovation, 4*(4), 42-52.

Caniëls, M. C. J., Lenaerts, H. K. L., & Gelderman, C. J. (2015). Explaining the internet usage of SMEs: The impact of market orientation, behavioural norms, motivation and technology acceptance. *Internet Research, 25*(3), 358-377.

Chen, W., & Kamal, F. (2016). The impact of information and communication technology adoption on multinational firm boundary decisions. *Journal of International Business Studies, 47*(5), 563-576.

Crick, D., & Spence, M. (2005). The Internationalisation of 'High Performing' UK High-Tech SMEs: A Study of Planned and Unplanned Strategies. *International Business Review, 14*(2), 167–185.

Gabrielsson, M., & Gabrielsson, P. (2011). Internet-based sales channel strategies of born global firms. *International Business Review, 20*(1), 88–99.

Gereffi, G., & Fernandez-Stark, K. (2011). Global Value Chain Analysis: A Primer. North Carolina, USA: Duke University.

Hagsten, E., & Kotnik, P. (2017). ICT as facilitator of internationalisation in smalland medium-sized firms. *Small Business Economics, 48*(2), 431–446.

Hamill, J., Tagg, S., Stevenson, A., & Vescozi, T. (2010). Editorial. *Journal of Marketing Management, 26*(3-4), 181-186.

Hänninen, M., Smedlund, A., & Mitronen, L. (2017). Digitalization in retailing: multi-sided platforms as drivers of industry transformation. *Baltic Journal of Management, 13*(2), 152-168.

Helm, B. (2018, 23.10.2018). The World's Most Ruthless Food Startup: The Inside Story of How HelloFresh Clawed Its Way to the Top. *Inc.*

HelvetiBox. (2017). A propos. Retrieved 09.03.2017, from https://www.helvetibox.ch/a-propos/
Hennart, J.-F. (2014). The Accidental Internationalists: A Theory of Born Globals. *Entrepreneurship Theory and Practice, 38*(1), 117–135.
Hernández, V., & Pedersen, T. (2017). Global value chain configuration: A review and research agenda. *Business Research Quarterly, 61*, 1-14.
Hymer, S. (1976). *The international operations of national firms: A study of direct foreign investment.* (MIT PhD dissertation, 1960), Cambridge, MA.
Ifinedo, P. (2011). Internet/e-business technologies acceptance in Canada's SMEs: an exploratory investigation. *Internet Research, 21*(3), 255-281.
Javalgi, R. R. G., Todd, P. R., Johnston, W. J., & Granot, E. (2012). Entrepreneurship, muddling through, and Indian Internet-enabled SMEs. *Journal of Business Research, 65*(6), 740–744.
Jean, R.-J. B., Sinkovics, R., & Kim, D. (2008). Information technology and organizational performance within international business to business relationships: A review and an integrated conceptual framework. *International Marketing Review, 25*(5), 563-583.
Jonsson, A., & Foss, N. J. (2011). International expansion through flexible replication: Learning from the internationalization experience of IKEA. *Journal of International Business Studies, 42*(9), 1079–1102.
Juho, A., & Mainela, T. (2009). External facilitation in the internationalization of high-tech firms. In J. Larimo & T. Vissak (Eds.), Research on Knowledge, Innovation and InternationalizationProgress in International Business Research (Vol. 4, pp. 185 - 204): Emerald Group Publishing Limited.
Kim, D. (2003). The internationalization of US Internet portals: Does it fit the process model of internationalization? *Marketing Intelligence & Planning, 21*(1), 23-36.
Knight, G. (2000). Entrepreneurship and Marketing Strategy: The SME Under Glohalization. *Journal of Intemational Marketing, 8*(2), 12-32.
Knight, G., & Cavusgil, S. T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing, 8*, 11-26.
Kollmann, T., & Christofor, J. (2014). International entrepreneurship in the network economy: Internationalization propensity and the role of entrepreneurial orientation. *Journal of International Entrepreneurship, 12*(1), 43–66.
Lee, C., Lee, K., & Pennings, J. M. (2001). Internal capabilities, external networks, and performance: a study on technology-based ventures. *Strategic Management Journal, 22*(6-7), 615–640.
Lewis, A. (2016). Farfetch - Matchmaking Model. http://businessmodelzoo.com/exemplars/Farfetch
Li, J., Merenda, M., & Venkatachalam, A. R. (2009). Business Process Digitalization and New Product Development: An Empirical Study of Small and Medium-Sized Manufacturers. *International Journal of E-Business Research, 5*(1).
Li, L., Qian, G., & Qian, Z. (2012). The performance of small and medium-sized technology-based enterprises: Do product diversity and international diversity matter? *International Business Review, 21*(5), 941-956.
Lowy, A., & Hood, P. (2004). *The Power of the 2x2 Matrix: Using 2x2 Thinking to Solve Business Problem and Make Better Decisions*: Jossey-Bass.
Luo, Y., & Bu, J. (2016). How valuable is information and communication technology? A study of emerging economy enterprises. *Journal of World Business, 51*(2), 200-211.
Luo, Y., Zhao, J. H., & Du, J. (2005). The internationalization speed of e-commerce companies: an empirical analysis. *International Marketing Review, 22*(6), 693-709.
Mahadevan, B. (2000). Business models for Internet-based E-commerce: An anatomy. *California Management Review, 42*(4), 55-69.
Mahnke, V., & Venzin, M. (2003). The Internationalization Process of Digital Information Good Providers. *Management International Review, 43*(1), 115-142.
Martinez-Noya, A., Garcia-Canal, E., & Guillen, M. F. (2012). International R&D service outsourcing by technology-intensive firms: Whether and where? *Journal of International Management, 18*(1), 18-37.
Moen, Ø., Endresen, I., & Gavlen, M. (2003). Use of the Internet in International Marketing: A Case Study of Small Computer Software Firms. *Journal of International Marketing, 11*(4), 129-149.

Moen, Ø., Gavlen, M., & Endresen, I. (2004). Internationalization of small, computer software firms: Entry forms and market selection. *European Journal of Marketing, 38*(9-10), 1236-1251.
Moen, Ø., Koed Madsen, T., & Aspelund, A. (2008). The importance of the internet in international business-to-business markets. *International Marketing Review, 25*(5), 487-503.
Mudambi, R., & Zahra, S. (2007). The survival of international new ventures. *Journal of International Business Studies, 38*, 333–352.
Nambisan, S. (2017). Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship. *Entrepreneurship Theory and Practice, 41*(6), 1029–1055.
Neely, A. (2008). Exploring the financial consequences of the servitization of manufacturing. *Operations Management Research, 1*(2), 103-118.
Nummela, N., Saarenketo, S., & Puumalainen, K. (2004). Rapidly with a rifle or more slowly with a shotgun? Searching the company boundaries of internationalizing ICT firms. *Journal of International Entrepreneurship, 2*(4), 275–288.
Ojala, A., Evers, N., & Rialp, A. (2018). Extending the international new venture phenomenon to digital platform providers: a longitudinal case study. *Journal of World Business, 53*(5), 725-739.
Ojala, A., & Tyrvainen, P. (2006). Business models and market entry mode choice of small software firms. *Journal of International Entrepreneurship, 4*(2), 69–81.
Oviatt, B., & McDougall, P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies, 25*(1), 45–64.
Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance* (Vol. 1 edition): Free Press.
Porter, M. E., & Kramer, M. (2011). The Big Idea: Creating Shared Value. How to Reinvent Capitalism—and Unleash a Wave of Innovation and Growth. *Harvard Business Review, 89*(1-2), 62-77.
Quelch, J. A., & Klein, L. (1996). The Internet and international marketing. *Sloan Management Review, 37*(3), 60–75.
Rangan, S., & Adner, R. (2001). Profits and the Internet: Seven misconceptions. *MIT Sloan Management Review, 42*(44-53).
Reuber, R. (2016). *Multilingualism and the Internationalization of New Firms in Digital Markets*. Paper presented at the AIB-UKI Conference, London.
Reuber, R., & Fischer, E. (2011). International entrepreneurship in internet-enabled markets. *Journal of Business Venturing, 26*(6), 660-679.
Rezk, R., Srai, J. S., & Williamson, P. J. (2016). The impact of product attributes and emerging technologies on firms' international configuration. *Journal of International Business Studies, 47*(5), 610-618.
Rialp, A., Rialp, J., & Knight, G. A. (2005). The phenomenon of early internationalizing firms: what do we know after a decade (1993–2003) of scientific inquiry? *International Business Review, 14*(2), 147-166.
Rissanen, T., Ermolaeva, L., Ali, A., Torkkeli, L., & Saarenketo, S. (2019). The role of home market context in business model change in internationalizing SMEs. *European Business Review*.
Rugman, A. (1980). A new theory of the multinational enterprise: Internationalization versus internalization. *Columbia Journal of World Business, 15*(1), 23–33.
Schu, M., Morschett, D., & Swoboda, B. (2016). Internationalization Speed of Online Retailers: A Resource-Based Perspective on the Influence Factors. *Management International Review, 56*(5), 733–757.
Shaheer, N. A., & Li, S. (2018). The CAGE around cyberspace? How digital innovations internationalize in a virtual world. *Journal of Business Venturing*.
Singh, N., & Kundu, S. K. (2002). Explaining the Growth of E-Commerce Corporations (ECCs): An Extension and Application of the Eclectic Paradigm. *Journal of International Business Studies, 33*(4), 679-697.
Sinkovics, N., Sinkovics, R. R., & Ruey-Jer, B. J. (2013). The internet as an alternative path to internationalization? *International Marketing Review, 30*(2), 130-155.
Stallkamp, M., & Schotter, A. P. J. (2019). Platforms without borders? The international strategies of digital platform firms. *Global Strategy Journal*.
Strugatz, R. (2014). Farfetch Takes Steps To Double Sales. *Women's Wear Daily, 208*, 9.

Styles, C., & Genua, T. (2008). The rapid internationalization of high technology firms created through the commercialization of academic research. *Journal of World Business, 43*(2), 146–157.

Su, N. (2013). Internationalization Strategies of Chinese IT Service Suppliers. *MIS Quarterly, 37*(1), 175-200.

Susarla, A., Anitesh, B., & Whinston, A. B. (2003). Understanding the Service Component of Application Service Provision: An Empirical Analysis of Satisfaction with ASP Services. *MIS Quarterly, 27*(1), 91-123.

UNCTAD. (2017). World Investment Report. Investment and the digital economy *Conference on trade and development*. Geneva: United Nations.

Vandermerwe, S., & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal, 6*(4), 314-324.

Watson, G., Weaven, S., Perkins, H., Sardana, D., & Palmatier, R. (2018). International Market Entry Strategies: Relational, Digital, and Hybrid Approaches. *Journal of International Marketing, 26*(1), 30-60.

Weaver, C. (2011). Ahead of the competition. Retrieved from https://www.ft.com website: https://www.ft.com/content/aa415b16-ee72-11e0-a2ed-00144feab49a

Webster, F. E., Jr. (1992). The Changing Role of Marketing in the Corporation. *Journal of Marketing, 56*(4), 1–17.

Wentrup, R. (2016). The online–offline balance: internationalization for Swedish online service providers. *Journal of International Entrepreneurship, 14*(4), 562–594.

Yamin, M., & Sinkovics, R. R. (2006). Online internationalisation, psychic distance reduction and the virtuality trap. *International Business Review, 15*(4), 339-360.

Zaheer, S. (2002). The liability of foreignness, redux: a commentary. *Journal of International Management, 8*(3), 351-358.

Zhu, H., & Qian, G. (2015). High-tech firms' international acquisition performance: The influence of host country property rights protection. *International Business Review, 24*(4), 556-566.

Ziyae, B., Sajadi, S., & Mobaraki, M. (2014). The deployment and internationalization speed of e-business in the digital entrepreneurship era. *Journal of Global Entrepreneurship Research, 4*(1), 1-11.

Zou, H., Chen, X., & Ghauri, P. (2010). Antecedents and consequences of new venture growth strategy: An empirical study in China. *Asia Pacific Journal of Management, 27*(3), 393-421.

Zucchella, A., Palamara, G., & Denicolai, S. (2007). The drivers of the early internationalization of the firm. *Journal of World Business, 42*(3), 268–280.

Table 1. Sources identified by the literature review.

ID	Ref.	Type of research	Sample, if empirical
1	(Brouthers et al., 2016)	Empirical: Qualitative, semi-structured interviews, exploratory case study	Nine German companies (seven marketplaces, two communities)
2	(Zhu & Qian, 2015)	Empirical: Quantitative, secondary data	1191 international acquisitions (from 49 countries) made by US acquirers (ITC industry)
3	(L. Li et al., 2012)	Empirical: Quantitative, secondary data	278 US SMTEs (ITC industry)
4	(Mahnke & Venzin, 2003)	Empirical: Qualitative, exploratory case study	One CS: eBay
5	(Luo et al., 2005)	Empirical: Quantitative, secondary data	93 US Internet companies
6	(Crick & Spence, 2005)	Empirical: Qualitative, semi-structured interviews	12 in-depth interviews with UK high-tech SMEs
7	(Campos et al., 2009)	Empirical: Qualitative, semi-structured interviews, exploratory case study	Six Mexican companies
8	(Bell & Loane, 2010)	Empirical: Qualitative, exploratory case study	Five Internet companies
9	(Almor et al., 2014)	Empirical: Quantitative longitudinal study, secondary data	57 Israeli technology-based companies
10	(Kim, 2003)	Empirical: Qualitative, exploratory case study	Case studies: Yahoo! Inc., AOL, Lycos, and AltaVista
11	(Hennart, 2014)	Conceptual: Literature review, case study	Three case studies
12	(Reuber, 2016)	Empirical: Qualitative, case study	Seven eINVs
13	(Wentrup, 2016)	Empirical: Qualitative, semi-structured interviews, exploratory case study	Three Swedish companies
14	(Singh & Kundu, 2002)	Conceptual: Case study	Amazon.com, Yahoo.com, Landesend.com, Cnet.com, AOL.com, Ebay.com, etc.
15	(Mahadevan, 2000)	Conceptual: Case study	Amazon.com, AOL.com, Ebay.com, etc.
16	(Hänninen et al., 2017)	Empirical: Literature review, content analysis, qualitative case study	Alibaba Group, Amazon.com, eBay and Rakuten Group
17	(Susarla et al., 2003)	Empirical: Quantitative, questionnaires	256 software and services companies

18	(Su, 2013)	Empirical: Qualitative, semi-structured, secondary data, interviews, case studies	13 China-based IT service companies
19	(Ojala & Tyrvainen, 2006)	Empirical: Qualitative, secondary data, semi-structured open-ended interviews, case studies	Eight Finnish software companies
20	(Styles & Genua, 2008)	Empirical: Qualitative, personal interviews (observation, documentation), secondary data, case studies	Four Australian high-tech companies
21	(Juho & Mainela, 2009)	Empirical: Qualitative, longitudinal research, semi-structured interviews, secondary data (observation), in-depth case study	Two Finish high-tech companies
22	(Stallkamp & Schotter, 2019)	Empirical: Qualitative, interviews, secondary data, case studies, conceptual	Nine platform companies (country n/a)
23	(Javalgi et al., 2012)	Empirical: Qualitative, secondary data, in-depth case study	Three Indian companies
24	(Luo & Bu, 2016)	Empirical: Quantitative, face-to-face interviews, standardized questionnaires	6236 companies from 27 emerging economies
25	(Chen & Kamal, 2016)	Empirical: Quantitative, survey	22,000 US companies
26	(Rezk, Srai, & Williamson, 2016)	Empirical: Quantitative, questionnaire, interviews	96 interviews with designers, engineers, industry experts, and researchers from companies based in Europe, US, China, Brazil, Mexico, and Egypt
27	(Hagsten & Kotnik, 2017)	Empirical: Quantitative	Companies from 12 European countries (ESSLait firm-level datasets)
28	(Watson, Weaven, Perkins, Sardana, & Palmatier, 2018)	Conceptual: Case studies	Dubai Ports World, Michel's Patisserie Franchises, eBay Small Businesses, Adobe SMEs, Embraer Aircraft, Fleetguard Filters, Blackboard Educational, Google SMEs
29	(Shaheer & Li, 2018)	Empirical: Quantitative, longitudinal, cross country, secondary data	127 apps at Apple's app store
30	(Ojala, Evers, & Rialp, 2018)	Empirical: Qualitative, longitudinal single-case study, in-depth case study, interviews, secondary data	G-cluster from Japan
31	(Martinez-Noya, Garcia-Canal, & Guillen, 2012)	Empirical: Quantitative, multilanguage cross-country questionnaire, interviews	182 technology-intensive companies from the US and European Union

32	(Caniëls, Lenaerts, & Gelderman, 2015)	Empirical: Quantitative, questionnaire	78 Belgian SMEs
33	(Ziyae, Sajadi, & Mobaraki, 2014)	Empirical: Quantitative, questionnaire	135 Danish SMEs
34	(Gabrielsson & Gabrielsson, 2011)	Empirical: Qualitative, case study, interview, semi-structured questionnaire, secondary literature	35 Finnish SMEs
35	(Ifinedo, 2011)	Empirical: Quantitative, questionnaire	214 Canadian SMEs

Table 2. Overview of metrics from the sources identified in the literature review.

ID	Terms used to define digitalized/ing companies	Definitions	DOD metrics	DOI metrics	DOI (range)	Type of companies
1	ibusiness/e-business companies	Any firm operating online that provides its products/services to customers using the Internet and other computer-based information system technologies.	Online platform	Sales; number of users in different markets, networks	Number of foreign markets (1–150)	Web-based (products and services)
2	High-tech companies	n/a	High-tech industry	Entry modes: Acquisitions; post-acquisition performance	>1 foreign countries	IT (products and services)
3	Small- and medium-sized technology-based enterprises	Enterprises that employ fewer than 500 people and have R&D intensity >3.5%.	High-tech industry	International diversification: Geographic spread and concentration; product diversification: Related	>1 foreign countries	High-tech (products and services)

				and unrelated diversification		
4	Digital information goods providers	Companies deriving most income from one or more Internet-related activities.	Internet technology: Digital information goods	Entry mode (in a single foreign market) and entry patterns (across foreign markets), networks	International company	Web-based (services)
5	e-commerce companies	Companies whose business activities are entirely Internet-based.	Online platform/eShop/marketplace	Speedy foreign market entry, sequence, coverage	>1 foreign countries	Web-based (products and services)
6	High-tech SMEs	Generally, small- and medium-sized companies with advanced tech knowledge and capabilities, an educated workforce, and the ability to adapt quickly to fast-changing environments.	Advanced tech knowledge and capabilities	Speed of internationalization, years from start-up; sales volume and growth, profitability and market share; market strategy, networking	>1 foreign countries	High-tech (products and services)
7	New technology-based companies	Independent companies 10 years old or younger, and their operations are based on exploiting the firm's technological resources, meaning as the firm actively develops, it produces and/or commercializes technology.	Technology companies (from Technology-Based Business Incubator Network)	Relationship between technology strategy and performance	n/a	Technology-based (products and services)
8	"New-wave" global companies	Entrepreneurial companies that *"pursue rapid and dedicated internationalization from inception or shortly thereafter"* (Oviatt & McDougall, 1994, p. 49). The Internet is a key driver of business development and speedy internationalization.	Internet-based companies	Rapid internationalization based on close collaboration with other companies and co-creation with customers, networking	>1 foreign countries	Web-based (products and services)

9	Maturing technology-based, born-global companies	Often characterized by proprietary technologies and innovations.	Information and communication technology (ICT) sector: software, hardware, electronics industries	Entry modes: Mergers and acquisitions	>1 foreign countries	High-tech (products and services)
10	Internet portals	Internet companies.	Online portal	Entry modes, speed, internationalization strategy	>1 foreign countries	Web-based (services)
11	Accidental internationalists	INVs/BGs possess superior technological resources which they exploit by selling knowledge-intensive products. Acquiring foreign customers is for INVs/BGs no different than acquiring domestic ones. In that sense, INVs/BGs are accidental internationalists.	Technology company (Atlassian)	Speed, knowledge, business model	>1 foreign countries	Web-based (products and services)
12	eINV	A venture whose business model is based on a digital platform and that seeks, from inception, to derive significant competitive advantage from international growth.	Digital platform	Language boundaries, adaptation, standardization	>1 foreign countries	Web-based (services)
13	Online service providers	Any company, organization, or group providing an online service.	Web and mobile technology companies	Online–offline balance: Speed, geography, mode of entry	>1 foreign countries	Web-based (services)
14	e-commerce corporations	Organizations engaged from inception in electronic commerce; derive significant	Online platform/eShop/marketplace	Growth, networks	>1 foreign countries	Web-based (services)

		competitive advantage from the use of network resources resident in virtual networks of commercial collaborative alliances.				
15	Internet-based business, Internet-based e-commerce, and business over the net	Organizations that conduct commercial transactions with business partners and buyers over the net (exclusively or in addition to brick-and-mortar operations).	Online platform/portal/eShop/marketplace	Business model	>1 foreign countries	Web-based (product and services)
16	Digital multi-sided platforms	Facilitate interaction and the seamless exchange of products between consumers and independent suppliers through a multi-sided digital platform-mediated marketplace.	Online platform/marketplace	Business model	>1 foreign countries	Web-based (services)
17	Application service providers (ASPs)	Company that provides access to remotely hosted IT applications over a wide area network (WAN),virtual private network (VPN), or the Internet.	Online platform/marketplace	Business model	>1 foreign countries	Web-based (services)
18	IT service suppliers	n/a	Software solutions	Business strategy: Time to internationalize, entry modes	>1 foreign countries	Software (products and services)
19	Software companies	n/a	Software solutions	Variation of business models, entry modes	>1 foreign countries	Software (products and services)
20	High-technology companies	n/a	Software and hardware solutions	Networks, entrepreneurial orientation	>1 foreign countries	High-tech (products and services)

21	High-tech companies	n/a	Software and hardware solutions	Entry modes (external facilitation), networks	>1 foreign countries	High-tech (products and services)
22	Digital platform companies	Companies with business models based on digital platforms.	Online platform/marketplace	Business model, networks, entry modes, market selection	>1 foreign countries	Web-based (services)
23	Internet-enabled SMEs	Companies with business models based on Internet technologies.	Online platform/marketplace	Business model, decision-making	>1 foreign countries	Web-based (services)
24	Emerging economy enterprises	n/a	ICT resources/assets	Export sales, national sales	>1 foreign countries	Products and services
25	Multinational firm	n/a	ICT adoption (e.g. Internet-enabled network technology, e-commerce apps)	International trade	>1 foreign countries	Manufacturing-based
26	Multinational firm	n/a	Product attributes (tier structure, value density, knowledge tacitness and embeddedness, product modularity)	International configuration of value chain (inward)	>1 foreign countries	Manufacturing-based
27	SMEs	n/a	ICT usage (website, online sales, ICT-schooled employees)	Export performance (export activities, foreign ownership)	>1 foreign countries	Manufacturing and services
28	n/a	n/a	e-commerce, digital delivery, SaaS, logistic and	Entry modes, networks	>1 foreign countries	Manufacturing and services

			communication technology infrastructure			
29	Start-ups	n/a	Mobile apps	International penetration	>1 foreign countries	Services
30	Digital platform providers/digital-based INVs	Digital platforms are defined as *"a shared, common set of services and architecture that serves to host complementary offerings"* (Nambisan, 2017, p. 1032)	Online platform	Network, entry modes	>1 foreign countries	Services
31	Technology-intensive companies	Coordinate and integrate distributed activities along their value chains; explore and exploit emerging technologies	e-commerce, digital delivery, SaaS, logistic and communication technology infrastructure	Outsourcing (R&D)	>1 foreign countries	Manufacturing and services
32	SMEs	n/a	Internet usage and technology	Market orientation	>1 foreign countries	Manufacturing and services
33	Electronic businesses	n/a	Internet-based technologies	Speed of foreign market entry	>1 foreign countries	Manufacturing and services
34	Born-global firms	A firm that *"from inception, seeks to derive significant competitive advantage from the use of resources and the sales of outputs in multiple countries"* (Oviatt & McDougall, 1994, p. 49)	Internet-based channels, technology infrastructure, brick-and-mortar	Entry modes, international sales	>1 foreign countries	Manufacturing and services
35	SMEs	n/a	Use of Internet and e-business technologies	International sales	>1 foreign countries	Manufacturing and services

PUBLICATION II

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S.

Internationalization of born digital companies

Publication in:
A. Chidlow, P. Ghauri, T. Buckley, A. Qamar, E. Gardner & E. Pickering (Eds.), *The Changing Strategies of International Business: How MNEs Manage in a Changing Commercial and Political Landscape* (2019), pp. 199-220,
Cham: Palgrave Macmillan.

10

The Internationalization of Born-Digital Companies

Ioan-Iustin Vadana, Lasse Torkkeli, Olli Kuivalainen, and Sami Saarenketo

Introduction

Digital technologies provide businesses increasingly efficient ways to internationalize, by *digitalizing* parts of their value chain (Wentrup 2016). Indeed, a completely new type of company has emerged that bases its business model on the latest web and mobile technologies and the larger phenomenon of digitalization (Brouthers et al. 2016). The arrival of this type of company in almost all sectors of activity was made possible by the development of Web 2.0 (Addison 2006; Bell and Loane 2010; Lee et al. 2008; O'Reilly 2007), after the dot-com bubble (O'Reilly 2004), followed by Web 3.0 (Barassi and Treré 2012; Fuchs et al. 2010; Hendler 2009; Lassila and Hendler 2007). Even given these developments, entrepreneurship in a digitalized context is considered a distinct topic (Brouthers et al. 2016; Nambisan 2017; Wentrup 2016). Building on the research of Nambisan (2017), Wentrup (2016), and Brouthers et al. (2016), we propose that these companies (i.e. technology firms, ibusiness, and online service providers) be termed *born-digital*. However, others have also suggested the reality of born-digitals and that, indirectly, they

I.-I. Vadana (✉) • L. Torkkeli • S. Saarenketo
Lappeenranta University of Technology, Lappeenranta, Finland
e-mail: Iustin.vadana@lut.fi; Lasse.Torkkeli@lut.fi; Sami.saarenketo@lut.fi

O. Kuivalainen
Lappeenranta University of Technology, Lappeenranta, Finland

University of Manchester, Manchester, UK
e-mail: Olli.kuivalainen@manchester.ac.uk; Olli.Kuivalainen@lut.fi

A. Chidlow et al. (eds.), *The Changing Strategies of International Business*, The Academy of International Business, https://doi.org/10.1007/978-3-030-03931-8_10

can impact entrepreneurship research. Therefore, we now extend this research to examine entrepreneurship from the international point of view.

Digitalization refers to the use of digital technologies to improve a business model to provide new revenue and value-producing opportunities (Acedo and Jones 2007; Brennen and Kreiss 2014; Li et al. 2009).[1] Based on our assertions and on existing research cited in our literature review, born-digitals are services or manufacturing companies in which most of the inward and outward value chains are digitalized soon after inception. This means that primary activities (inward: e.g. creating and producing; outward: e.g. delivery, marketing and sales, and support) are Internet-enabled (activated or coordinated by Internet applications and technologies). Born-digitals are companies that were digitalized early after foundation or were fully digitalized from day one (e.g. HelloFresh or Global Fashion Group). These companies are characterized by business models that facilitate a higher degree of digitalization, a development which in turn enables easier entry into global markets.[2]

In sum, since digitalization is a developing phenomenon in entrepreneurship (Brouthers et al. 2016; Nambisan 2017; Wentrup 2016), we argue that in addition to being relatively silent on the topic, the information provided by existent literature does not sufficiently describe the role of digitalization of the value chain on internationalization of born-digital companies. Thus, the main research question assessed in this study is: *How can born-digital companies be described based on the role of digitalization of the value chain on internationalization*?

The present exploratory study tackles the novelty of international digital entrepreneurship or internationalization of born-digitals. It is based on secondary literature and highlights the existence of a new phenomenon related to born-digital companies from two perspectives, digitalization of the value chain and degree of internationalization. A conceptual research framework will be used to analyze the selected sample to classify born-digital companies. The contribution of this chapter represents a framework that will guide the analysis.

The literature review, provided in the next section, presents the current research related to digitalization and internationalization, and digitalization of the value chain. Following this, the methodology and the constructs included in the proposed research model are described, and potential relationships

[1] Not to be confused with digitization, which is the process of converting any data into digits (1s and 0s) and represents the first step in realizing the phenomenon of digitalization (Brennen and Kreiss 2014).

[2] However, not all Internet-enabled companies are born-digital firms, because some of them are late in the process of digitalizing their activities. As this term is more holistic, readers may be confused.

among variables are presented. After analyzing the obtained results and examining the findings, the article concludes with a discussion of the implications of the results, the overall contribution of this study, limitations, and potential future avenues of research.

Literature Review

Digitalization and Internationalization

In recent years, the blend of new digital technologies has highlighted the uncertainty in entrepreneurial processes and results, as well as ways of addressing such unpredictability (Nambisan 2017). These technologies include big data and analytics, mobility and pervasive computing, cloud computing, virtual networks, social media, artificial intelligence (AI), and robotics (outlined in Table 10.1).

These advances happened in stages known as Web 2.0 and Web 3.0. Web 2.0 flourished under the Internet's network effects: 'databases that get richer the more people interact with them; applications that are smarter the more people use them; marketing that is driven by user stories and experiences, and applications that interact with each other to form a broader computing plat-

Table 10.1 The utilities of digital technologies

Type of digital technology	Description
Social media platforms	Develop digital patterns Trail of user personalities and choices Help to know customer better and understand his needs
Cloud computing	Uses the power of networks Affordable digital resources Makes any company seem big, regardless of size or resources
AI and robotics	Machine learning Algorithms learn to understand human behavior Suggest next purchase in advance
Big data and analytics	Users are individualized Poll of data gathered from web platforms, mobile apps and sensors Predict future trends and serve unique customers
Mobility and pervasive computing	Internet of things Gathers data from any device more naturally Creates big tanks of data

Source: Bell and Loane (2010), Brouthers et al. (2016), Lu and Liu (2015), Nambisan (2017), and Wentrup (2016)

form' (Musser and O'Reilly 2006, p. 3). Although Web 3.0 is still a concept under development, it is essentially viewed as semantic web technologies implemented and powered into large-scale web applications (Hendler 2009; Lassila and Hendler 2007). Overall, these technologies enabled communication and information transparency as well as user collaboration (Addison 2006; Barassi and Treré 2012; Lee et al. 2008), all of which contributed to the rise of Internet-enabled companies (Nambisan 2017; Wentrup 2016). Thanks to these evolutions in web and mobile technologies, born-digital companies are present not only in the information and communications technology (ICT) sector, but in most industrial sectors, not only to software or hardware industries (Bell and Loane 2010; Brouthers et al. 2016).

Various terms are used in the literature, such as *ibusiness* (Brouthers et al. 2016), *high-tech firms* (Almor et al. 2014; Crick and Spence 2005; Li et al. 2012; Zhu and Qian 2015), *digital information goods providers* (Mahnke and Venzin 2003; Wentrup 2016), *e-commerce companies* (Hänninen et al. 2017; Luo et al. 2005; Singh and Kundu 2002), *new technology-based firms* (Bell and Loane 2010; Campos et al. 2009; Mahadevan 2000; Reuber 2016, and *accidental internationalists* (Hennart 2014). And, in general, these are Internet-enabled companies, the operations of which are based online, and which actively develop, produce, and/or commercialize products/services to customers using the web and mobile technologies or other computer-based information system technologies built on the Internet infrastructure.

The arrival of such companies has raised questions, specifically regarding the processes of internationalization. However, the existing studies (Addison 2006; Bell and Loane 2010; Berry and Brock 2004; Freeman et al. 2006; Hamill et al. 2010; O'Reilly 2007) have been restricted to arguing the advantages that digital technologies and the Internet infrastructure provide for overcoming the barriers to internationalization these firms often face (Addison 2006; Arenius et al. 2006; Berry and Brock 2004; Shaw and Darroch 2004; Sinkovics et al. 2013). These studies are based on the traditional classification of internationalizing enterprises, including born-global (low, incremental, and high committers) (Melén and Nordman 2009), born-internationals (Kuivalainen et al. 2007; Kundu and Katz 2003), committed internationalists (Bonaccorsi 1992), international new ventures (Oviatt and McDougall 1994), and micro-multinationals (Dimitratos et al. 2003). The current literature shows previous research typically concentrated on outward processes to determine how firms internationalize, and less on inward ones. The existing literature, therefore, provides only a partial picture of the functions and marketing strategies used by Internet-enabled firms and neglects the potential role of inward processes in enhancing innovation and performance.

According to Luostarinen (1979) and Hernández and Nieto (2015), firms generally internationalize using two types of processes: inward (related to international supply operations) and outward (related to serving or selling in foreign markets). These processes are related to value chain activities: inward to creating and producing, and outward to delivery, marketing, sales, and support.

Digitalization of the Value Chain

The value chain describes the full range of activities that firms perform to bring products or services from conception to end use and after support. To be successful, a company must design a distinctive value proposition to cover the needs of a market niche. In general, a firm gains a competitive advantage from how it configures the value chain, or the set of activities involved in creating, producing, marketing and selling, delivering, and supporting its products or services (Porter and Kramer 2011). Given the fragmentation and dispersion of activities around the globe, management literature has used the terms *global value chain* (Gereffi and Fernandez-Stark 2011) and *global factory* (Buckley 2011; Buckley and Ghauri 2004) when some core activities are located in other countries. We use the definition of *value chain* given by Porter (1991), in which a company's value chain is a system of value-adding activities that connect the supply part of a company to its demand part.

Creating an overview of value chain configuration is therefore an examination of the activities involved. These activities can be grouped according to various criteria, differentiating primary or core activities—creating, producing, delivering, marketing, and selling the product or service—from support activities (Hernández and Pedersen 2017; Porter 1991; Porter and Millar 1985). Core activities are those needed for sustaining profitable operations that are complementary and important for competitive advantage; non-core activities are those that can easily be outsourced (Hernández and Pedersen 2017; Oviatt and McDougall 1994).

The evolution of these activities may depend on industry dynamics and changes in the market, which also determine modifications in the structure of the value chain. Generally, firms retain the core activities they do best in-house, and allocate more resources, time, and effort to these activities (Buckley 2011; Buckley and Strange 2015; Hernández and Nieto 2015; Hernández and Pedersen 2017).

Thus, digital technologies provide online businesses increasingly efficient ways to internationalize by digitalizing parts of their value chain. Such com-

panies tend to be new technology-based firms (Almor et al. 2014; Campos et al. 2009; Li et al. 2012) across different fields of activity and industry (Hagen and Zucchella 2011; Knight and Cavusgil 2004; Nambisan 2017; Power 2014); however, many scholars have found that fast internationalization exists only in highly technologized industries (Li et al. 2009; Luo et al. 2005; Mahnke and Venzin 2003). To survive in a dynamic environment, Internet-enabled companies must adapt very quickly (Bell and Loane 2010) and grow more rapidly than traditional firms (Brouthers et al. 2016; Wentrup 2016).

As mentions before, firms generally go international using inward and outward processes that are related to value chain activities. The extant literature shows previous research typically concentrated on outward processes to determine how firms internationalize, and less on inward ones. Therefore, the literature provides only a partial picture of the functions and marketing strategies used by Internet-enabled firms and neglects the potential role of inward processes in enhancing innovation and performance.

Classification of Born-Digital Companies

We analyze the phenomenon of born-digital companies using a framework that describes the internationalization dimension of these firms, as defined by their online-offline presence (Hennart 2014; Luo et al. 2005; Reuber 2016; Wentrup 2016). Following Lowy and Hood (2004), this was done using a 2×2 matrix for classification of digitalized (Internet-enabled) firms and for finding main patterns among these companies (Berrill and Mannella 2013; Brooksbank 1991).

Figure 10.1 illustrates the classification of born-digital companies across the two dimensions discussed above: degree of digitalization across value

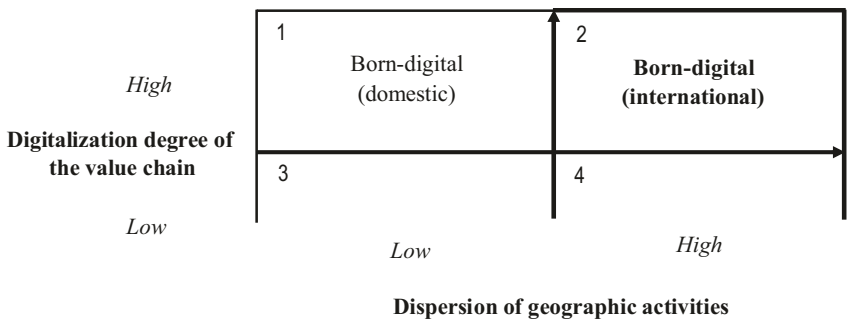


Fig. 10.1 Internationalization aspect of digitalized (Internet-enabled) firms

chain activities and degree of internationalization based on dispersion of geographic activities. To measure 'degree of internationalization,' we proposed a 'dispersion of geographical activities' measure (Brouthers et al. 2016; Li et al. 2012; Luo et al. 2005) as it is suitable for both online retailers who require a physical value chain and companies that have fewer demands for physical presence.

The internationalization dimension is expressed by the horizontal axis and comprises the number of countries in which these firms are most active (with offices), plus the number of localized websites or .com/.other domains in the country's official language(s). The first two quadrants comprise born-digital companies and the next two represent other types of companies, in different stages of digitalization, with domestic or international activities. The figure identifies two types of born-digital firms: born-digitals with more domestic activities and born-digitals with intensive international business. The third and fourth quadrants comprise those companies with a low-digitalized value chain, which have domestic, international, or global activities. According to Fig. 10.1, the more highly digitalized (Internet-enabled) a company is, the higher its degree of internationalization (Ojala and Tyrvainen 2006; Styles and Genua 2008; Su 2013). However, not all born-digital companies have intense international activities, even though they could start to sell to international customers online rather easily from inception.

At one extreme, an absolute online presence means only a digital footprint; for instance, all the value chain activities would be Internet-enabled. At the other extreme, a pure offline presence means that only physical resources, such as staff, are present (Wentrup 2016). In practice, the degrees of online and offline presence may vary over time, leading to asymmetry. Balance results from the nature of the resources that are committed to these two spatial domains (Wentrup 2016). The efficiency of the internationalization strategy overall, together with strong marketing skills and backed up by external funding, allows such ventures to 'bootstrap' into international markets (Bell and Loane 2010). To examine this classification, we applied the matrix in Fig. 10.1 to classify a sample of internationally operating firms.

Methodology

Sample Selection

This study is exploratory, based on secondary online literature. We explore this new phenomenon by describing the internationalization of born-digital companies and creating an initial model based on several variables and on a

sample of firms positioned within the model. Four *shallow*[3] (Loane 2006) exploratory cases were built based on secondary sources (Bell and Loane 2010; Hänninen et al. 2017; Mahnke and Venzin 2003) to test the proposed framework.

The methodology used by *Fortune* magazine to build this list of companies is based on ranking by valuation. The list is based on a combination of data from PitchBook, CB Insights, news reports, and their investigation (Fortune Magazine 2016). The resulting sample comprises a group of 18 firms from a variety of industry sectors. All 18 companies were founded in Europe, but most of them have intensive international activities around the world. These companies are included on the so-called unicorn list, compiled by *Fortune* magazine in 2016. They are called 'unicorns' primarily due to their rapid growth and their market valuations of $1 billion or more; however, this aspect was not considered among the selection criteria.

The firms analyzed in the study are Spotify, Global Fashion Group, Delivery Hero, HelloFresh, Klarna, Adyen, Avito.ru, BlaBlaCar, Skyscanner, Blippar, Oxford Nanopore, Auto1 Group, CureVac, Avast Software, Farfetch, Funding Circle, Home24, and TransferWise (Powa, the 19th company on the list, was excluded because of the financial problems the company is facing). These firms were chosen because they were founded after 2000 (an exception was made for Avast Software), when web technologies evolved into Web 2.0 (Cearley et al. 2005; O'Reilly 2007). Other selection criteria included the sector in which these companies operate and that the firms are well known around the world so that important sources of information can be found online.

The firms and their descriptions are listed in Tables 10.2 and 10.3. Of these cases, four *shallow* (Loane 2006) exploratory cases were built based on secondary sources (Bell and Loane 2010; Hänninen et al. 2017; Mahnke and Venzin 2003). The internationalization year shown in Table 10.2 is the year in which the companies had their first international activities.

Measure Development

The firms were investigated across two dimensions: degree of digitalization and degree of internationalization. The degree of digitalization was evaluated based on the digitalization of the inward and outward (Hernández and Pedersen 2017) components of their value chain: creating, producing, selling,

[3] Are called *shallow* by Loane (2006) cases because are made based on secondary literature such as the World Wide Web (WWW), databases/sites, firm websites, government, and industry reports.

Table 10.2 Firms in the sample

ID	Rank	Company name	Location city	Location country	Industry	Founded	Year of international ization
1	15.	Spotify	Stockholm	Sweden	Streaming media	2006	2008
2	31.	Global Fashion Group	Luxembourg	Luxembourg	E-commerce	2011	2011
3	35.	Delivery Hero	Berlin	Germany	Food delivery	2011	2012
4	46.	HelloFresh	Berlin	Germany	Food delivery	2011	2012
5	48.	Powa	London	UK	Mobile payments	2007	
6	51.	Klarna	Stockholm	Sweden	Mobile payments	2005	2008
7	54.	Adyen	Amsterdam	The Netherlands	Mobile payments	2006	2009
8	68.	Avito.ru	Moscow	Russia	Online classifieds	2008	2008
9	75.	BlaBlaCar	Paris	France	Transportation	2006	2009
10	79.	Skyscanner	Edinburgh	UK	Flight, hotel search engine	2003	2011
11	82.	Blippar	London	UK	Augmented reality	2011	2012
12	91.	Oxford Nanopore	Oxford	UK	Biotechnology	2005	2009
13	102.	Auto1 Group	Berlin	Germany	E-commerce	2012	2015
14	104.	CureVac	Tübingen	Germany	Biotechnology	2000	2015
15	129.	Avast Software	Prague	Czech Republic	Computer security	1988	2013
16	137.	Farfetch	London	UK	E-commerce	2008	2010
17	138.	Funding Circle	London	UK	Crowdfunding	2010	2013
18	139.	Home24	Berlin	Germany	E-commerce	2012	2012
19	164.	TransferWise	London	UK	Mobile payments	2011	2015

Source: 'The unicorn list,' compiled by *Fortune* magazine in 2016

delivering, and supporting (Porter 1991; Porter and Millar 1985). Our goal was to discover how prevalent a digital basis was in these highly valued companies. Each activity of the value chain was coded with 1 if it was based or coordinated with a web technology or a non-web digital application, or with 0 if not. Subsequently, each firm's value chain was analyzed through this perspective using the information available in the secondary literature. This produced a digitalization scale of 0–5. The degree of internationalization was analyzed in line with the model illustrated in Fig. 10.2. The firms were added to the first two quadrants if the digitalization degree was 4 or greater, and to the last two if the degree was 3 or less.

The internationalization variables were analyzed based on the combined the results of localized websites or .com/.other, targeted country language, and the number of countries in which these companies are most active (besides their home country). Each variable (office or localization) was coded with 1. The highest number resulting from the sum of these two variables was 92 and the lowest was 2. The numbers were then normalized. First, every

Table 10.3 Data analyzed for case comparison

ID	Company name	Total localizations and .com/.other domain with country official language	Number of countries	Total value chain Scale 0-5
1	Spotify	52	18	5
2	Global Fashion Group	24	22	4
3	Delivery Hero	32	21	4
4	HelloFresh	9	9	5
5	Powa	n/a	n/a	n/a
6	Klarna	9	17	5
7	Adyen	3	10	5
8	Avito.ru	1	1	4
9	BlaBlaCar	22	13	4
10	Skyscanner	41	7	5
11	Blippar	6	6	5
12	Oxford Nanopore	1	1	2
13	Auto1 Group	21	21	4
14	CureVac	2	2	1
15	Avast Software	52	5	5
16	Farfetch	84	8	4
17	Funding Circle	5	4	4
18	Home24	9	7	4
19	TransferWise	9	6	5

result was divided by the highest number, resulting in a scale from 0 to 1. Second, these results were multiplied by 5 to create a scale of 0–5, like that used for digitalization. The raw data is provided in Table 10.3 and a sample of the coding results for the selected cases (see sections 'Avito.ru: Domestic Born-Digital,' 'HelloFresh: International Born-Digital,' and 'Oxford Nanopore: Domestic Low-Digitalized Company') across their value chain is listed in Appendix 2.

Analysis and Findings

Figure 10.2 presents the categorization of the sample companies across a 2×2 matrix that distinguishes between the degrees of digitalization and internationalization to classify the companies according to the proposed research model.

The research framework identifies types of born-digital firms in the first three quadrants of the matrix. The first two quadrants in Fig. 10.2 represent the born-digital companies, which tend to have similar businesses. However, this is not a general rule for all the firms analyzed in this chapter. Indeed, some of these firms have intensive international activities, and some of them focus

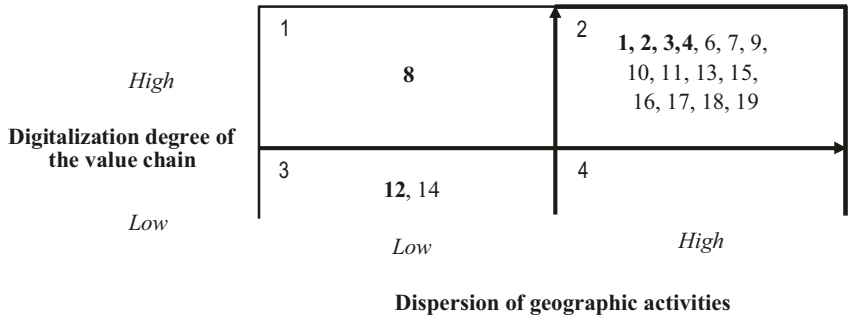


Fig. 10.2 Sample classification of the born-digital companies

more on domestic markets. All the other firms are digital from inception or soon after foundation. The difference between them is the internationalization dimension. All the firms presented in the framework have an Internet-based business model and are born-digital companies. Besides internationalization, another difference lies in the digital distribution of the final product. The first two quadrants represent the companies the value chain of which is digitalized, or at least, all five components of the value chain are coordinated by internet technologies and are conducted online. The last two quadrants are characterized by companies the value chain of which is not digitalized.

Most of the firms analyzed can, in the initial stage of internationalization, fully operate in a market without an offline presence, despite legal compliance and market-specific requirements. The length of the interval between online and offline is dependent on the business model and the sales and distribution channels used. However, as the revenues or number of users grow, even B2C-oriented firms gradually localize their offers and frequently establish an offline presence. According to Wentrup (2016), regardless of how online and digitalized a firm might be initially, the geographical impact and the localization issue become increasingly important as the firm grows. For the same reason, most of the companies establish offices in other countries. Tangible foreign assets in international markets may be used, but are often defined by business offices (UNCTAD 2017) needed more for policy issues or customer support. Furthermore, it is easier to sell ads to local companies and deal with local rights holders or to establish development offices around the world.

To analyze the firms in more detail, we selected companies from each quadrant of the initial sample, namely, Avitor.ru, HelloFresh, and Oxford Nanopore. They were chosen because they differ in the type of service they

provide, their target customers, their size, and their business model. Their similarities and differences should make this sample representative of at least a part of born-digital companies. We selected the cases that can best explain the differences between the matrix cells.

Avito.ru: Domestic Born-Digital

Avito.ru, an online classified ads platform, represents a born-digital company with a value chain that was highly digitalized soon after inception. Its platforms include an online payment system; in addition, it uses online marketing campaigns based on data generated by its users. Most of its services can be delivered from headquarters. Avito.ru has its headquarters in Moscow and operations in only one foreign country. Regarding localized websites and. com/.other web domains with the country's official language(s), this firm scores one website localization with country-targeted language.

HelloFresh: International Born-Digital

HelloFresh is an online platform from which users can order a box with preportioned food ingredients. The company was founded in 2012. It showed growth of 90% over 2015 and closed 2016 with revenue amounting to €894 million. HelloFresh has its headquarters in Berlin and operations in more than nine countries across three continents. Regarding localized websites and .com/.other web domains with the country's official language(s), HelloFresh scores nine website localizations with country-targeted language and one website translation with a .com domain.

Oxford Nanopore: Domestic Low-Digitalized Company

Oxford Nanopore Technologies Limited develops and commercializes nanopore-based electronic systems for analysis of single molecules. Its main locations are the UK and the US.

While the secondary literature lacks detailed information about some of the firm's value chain, social media platforms and mobile apps are used for disseminating company information, organizing special events and conferences, and managing and communicating with the community of scientists all over the world. However, their business model is aligned to the industry and represents a consumer goods company. In general, companies like this spend two

times more on sales and marketing than on R&D. Regarding internationalization, this company scores one website translation and has activities in another foreign country.

Summary of Cases

Born-digital companies go international faster than others, thanks to Internet technologies and the nature of their business model (see Appendix 1). These companies are designed for rapid internationalization from inception (Mäki and Hytti 2008; Saarenketo et al. 2004). According to Hennart (2014), the digitalization of their business model makes them accidental internationalists, with one key element in common—Internet technologies (Bell and Loane 2010; Hagen and Zucchella 2011).

The degree of internationalization of a born-digital company is closely related to the degree of digitalization of its value chain. Thus, to internationalize to a certain scale, these companies must digitalize their value chain. Nevertheless, it is easier to internationalize online via a controlled entry mode (Yamin and Sinkovics 2006). This could mean that a company's online presence might be an 'optical illusion,' so that the firms neglect the complexity of offline business (Wentrup 2016).

Discussion and Conclusions

In this study, we found that 16 of the 18 companies examined digitalized their value chain (inward and outward) from day one or soon thereafter. The two exceptions are the biotechnology firms, Oxford Nanopore and CureVac, which are still on the road to digital business. Thus, born-digital companies are, in general, companies that have undergone that transformation after inception (or did not have the need to). These are opposed to other companies that must, at some point, undergo the process of digital transformation process.

Theoretical Contribution

The contribution of this study is its presentation of a framework that enables classifying born-digital firms when examining their internationalization and value chain activities. By stressing the relevance of a digitalized value chain,

both inward and outward, and internationalization using a balance between online and offline presence, we present a conceptual analysis arguing that born-digital companies are a distinct type of internationalizing firm with an Internet-enabled, inward-outward digitalized value chain from day one or soon after inception.

This research enables classifying companies to explain this new phenomenon of digitalization. Within this framework, four types of companies were described regarding the digitalization of their value chain activities (Porter 1985) and localized websites in the official language of the targeted country. The firm cases show that early digitalization of the value chain, translated into a stronger online presence, followed by a gradual increase of resources dedicated to the offline presence, might represent one solution for sustainable growth for born-digital firms.

We observed that the internationalization process of born-digital companies includes several steps: gradual regional expansion followed by internationalization speed, both of which are supported by Internet technologies. The rapidity of internationalization is best explained by the international venture or born-global phenomenon (Cavusgil and Knight 2015; Madsen and Servais 1997; Oviatt and McDougall 2005), ICT, and Internet-related internationalization theories (Kim 2003; Singh and Kundu 2002; Yamin and Sinkovics 2006); the gradual regional pattern, however, finds support in the Uppsala model (Johanson and Vahlne 1977). Nevertheless, not all born-digital companies operate internationally, although they could sell to international customers online rather easily from day one.

Despite expectations, our research shows that the digitalization of value chain activities is not closely related to the internationalization dimension of born-digital companies. Therefore, the degree of digitalization of the value chain activities does not significantly influence the internalization of born-digital firms. Instead, the business model influences the internationalization of born-digital companies.

Regarding this research, some internationally operating born-digital companies might represent a subset of born-global firms; however, based on Hennart's (2014) work, we might expect the behavior of born-digitals to be determined largely by their business models as well. The novel business models used by digital companies generate revenues from a very early stage (Bell and Loane 2010). These companies are perceived as rapidly internationalizing because of the degree of digitalization integrated into their business model from inception (Brouthers et al. 2016; Wentrup 2016). This could be a topic for further research.

Overall, this study brings a suitable framework to make sense of the spread discussion on digitalization in the context of international entrepreneurship and business. This chapter represents a conclusive work of a new concept defined as *born-digital*. The concept explains a new phenomenon through a new perspective, analyzing the digital value chain activities correlated with internationalization across two dimensions: online and offline activities. The study brings together several concepts that are critical for international business and international entrepreneurship in general; this is an integrative work. Going forward, classification helps to develop the theory by analyzing the internationalization patterns of these companies.

Managerial and Social Implications

This research has several implications for management, such as examples of digitalized business strategies by which traditional companies can go international more efficiently. The internationalization strategies of various types of companies could become important for the future of most companies. These goals recognize that digitalization based on Internet technologies can aid global development by connecting neglected and underserved communities of customers around the world. Companies from almost any industry can use the example of born-digitals as a set of best practices in their own process of digitalization.

We observed that most of the companies we studied organize their business around online platforms; this generally transforms the logic of any industry sector, making transactions between buyers and suppliers easier and more dynamic. Through services provided by digital platforms, digital firms create consumer value. They provide value-adding services, such as loyalty programs, online personal customer support, and a last-mile delivery system; such services can convince customers to focus their purchases on one platform. We also noticed that after a certain point in their growth, these companies can transform their platform into large marketplaces due to the network effects that allow suppliers to handle the actual transaction of goods with consumers on the platform.

Wentrup (2016) claims that the company sample analyzed in his research cannot fully operate in a market without being present offline. Thus, companies are limited in how long or at what size they can operate fully online without needing a physical presence. The importance of offline entry also seems to increase with time (Hennart 2014; Mahnke and Venzin 2003; Reuber 2016; Wentrup 2016). The outcomes of these studies suggest that

born-digitals are more frequently born at home rather than born-global (Hennart 2014). Our sample did not behave differently.

Limitations and Future Research

This exploratory study has several limitations. Its scope is to discover theoretical conceptualizations and empirical findings regarding the internationalization of digitalized companies. However, it should be remembered that available information about the subject is limited. We also acknowledge that other measures may be used to measure the degree of internationalization.

Sample selection represents an important limitation. A case can be made for selection bias, since the firms were selected especially because of their year of inception, activity sectors, and information available online. Market valuation was not a criterion. Also, we could have selected companies founded more recently.

Another potential limitation is the measurement used for the value chain digitalization. This is no trivial matter, since most of the activities are Internet-related and the amount of information available can make it difficult to track where in their value chain the companies have their activities. This is especially true when those activities exist in a digital format.

Future research should further explore corresponding themes. For instance, the born-digital phenomenon has been analyzed through studying large firms; other perspectives are also needed on how the value chain structure and digitalization, country of origin, and the dynamism of the industry may influence the evolution of born-digital companies. Also, future studies could empirically examine the kind of internationalization strategy that born-digital companies use, the role of internationalization strategy on international performance, or the customers' view regarding the companies' international performance.

A worldwide shift marked by technology is changing the balance of information in favor of customers. Digital firms create this shift by collaborating with consumers to not only develop new products and services, but also to enable more effective buyer interactions and optimize the customer experience (Cavusgil and Knight 2015). Digital technologies foretell the next era in both local and international entrepreneurship. This is a time in which the traditional ways and processes of following entrepreneurial opportunities will be increasingly questioned and reworked (Nambisan 2017). These firms represent the beginning of a new era in how internationalization will occur in the years to come.

Appendix 1: Some of the Digitalization Advantages of the Value Chain

Value chain	Description
Creating	Optimized inventory planning based on demand forecasting Data-based preventive asset maintenance Integration with partners in digital ecosystem to optimize service delivery Virtual organizations enabled by mobility and seamless cooperation
Producing	Creates new digital products, services, and offerings Rapid prototyping with customer interaction Integrates products and services into solutions that have digital components Convergence of products enabled by digital technologies
Selling and marketing	Analytics-driven and dynamic customer segmentation or Customer relationship management (CRM) platforms Faster time to market with targeted offerings New earnings (subscription, licensing, credit, 'freemium,' etc.) models
Delivering	Digitalized and automated delivering processes Efficiency of the transportation planning using 'last mile' logistics Coordination between storage, stocks, and delivering
Supporting	Systematic management of customer management services Digital manuals with instructions powered by augmented reality apps Forums, e-chat, Frequently asked questions (FQA), virtual assistant, social media

Source: Data sample

Appendix 2: The Sample Coding of the Results of the Empirical Sample

Value chain	Avito.ru—B2C and B2B	HelloFresh—B2C	Oxford Nanopore
Creating	R&D—technology; relationships with entrepreneurs for eShops	R&D—technology; supplier relationships; taste clustering; hyper-personalization	R&D; supplier relationships; storing and distributing the raw materials, inputs, components, and parts used in the production process
Producing	E-commerce fashion platform (core business) for classified ads and online shops	Food box (core business), recipes, complex web platform; web apps	Nanopore DNA sequencer (core business), the MinION; website; online shop

Value chain	Avito.ru—B2C and B2B	HelloFresh—B2C	Oxford Nanopore
Selling and marketing	Online payment system; online/offline marketing campaigns	Online payment system; online/offline marketing campaigns; ambassador marketing	Online payment system; online/offline marketing (lack of info)
Delivering	Software product. No need of delivery system; services/products can be delivered from headquarters; doesn't help with distribution costs	Operated warehouse facilities; logistics partners; local couriers; own last mile	Logistics partners
Supporting	Online customer care/operated call centers	Online customer care/customer care agents	Online customer care/customer care agents
Business model	Marketplace (fee based); SaaS model	Subscription model	Pharmaceutical products model

References

Acedo, F., & Jones, M. (2007). Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms. *Journal of World Business, 42*(3), 236–252.

Addison, C. (2006). Web 2.0: A new chapter in development in practice? *Development and Practice, 16*(6), 623–627.

Almor, T., Tarba, S. Y., & Margalit, A. (2014). Maturing, technology-based, born-global companies: Surviving through mergers and acquisitions. *Management International Review, 54*(4), 421–444.

Arenius, P., Sasi, V., & Gabrielsson, M. (2006). Rapid internationalization enabled by the Internet: The case of a knowledge intensive company. *Journal of International Entrepreneurship, 3*(4), 279–290.

Barassi, V., & Treré, E. (2012). Does Web 3.0 come after Web 2.0? Deconstructing theoretical assumptions through practice. *New Media & Society, 14*(8), 1269–1285.

Bell, J., & Loane, S. (2010). 'New-wave' global firms: Web 2.0 and SME internationalisation. *Journal of Marketing Management, 26*(3–4), 213–229.

Berrill, J., & Mannella, G. (2013). Are firms from developed markets more international than firms from emerging markets? *Research in International Business and Finance, 27*(1), 147–161.

Berry, M. M. J., & Brock, J. K.-U. (2004). Marketspace and the internationalization process of the small firm. *Journal of International Entrepreneurship, 2*(3), 187–216.

Bonaccorsi, A. (1992). On the relationship between firm size and export intensity. *Journal of International Business Studies, 23*(4), 605–635.

Brennen, S., & Kreiss, D. (2014). Digitalization and Digitization. Retrieved from Culture Digitally, http://culturedigitally.org/2014/09/digitalization-and-digitization/. Accessed October 10th, 2017.

Brooksbank, R. (1991). Defining the small business: A new classification of company size. *Entrepreneurship & Regional Development, 3*(1), 17–31.

Brouthers, K. D., Geisser, K. D., & Rothlauf, F. (2016). Explaining the internationalization of ibusiness firms. *Journal of International Business Studies, 47*(5), 513–534.

Buckley, P. J. (2011). International integration and coordination in the global factory. *Management International Review, 51*(2), 269–283.

Buckley, P. J., & Ghauri, P. N. (2004). Globalisation, economic geography and the strategy of multinational enterprises. *Journal of International Business Studies, 35*(2), 81–98.

Buckley, P. J., & Strange, R. (2015). The governance of the global factory: Location and control of world economic activity. *Academy of Management Executive, 29*(2), 237–249.

Campos, H. M., del Palacio Aguirre, I., Parellada, F. S., & de la Parra, J. P. N. (2009). Technology strategy and new technology based firms. *Journal of Technology Management & Innovation, 4*(4), 42–52.

Cavusgil, S. T., & Knight, G. (2015). The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization. *Journal of International Business Studies, 46*(1), 3–16.

Cearley, D., Fenn, J., & Plummer, D. (2005). Gartner analyzes hottest topics of 2005: Open-source, voice/data convergence, service-oriented architecture, it utility and global sourcing. Gartner Special Report.

Crick, D., & Spence, M. (2005). The internationalisation of 'high performing' UK high-tech SMEs: A study of planned and unplanned strategies. *International Business Review, 14*(2), 167–185.

Dimitratos, P., Johnson, J., Slow, J., & Young, S. (2003). Micro-multinationals: New types of firms for the global competitive landscape. *European Management Journal, 21*(2), 164–174.

Fortune Magazine. (2016). The unicorn list. http://fortune.com/unicorns/

Freeman, S., Edwards, R., & Schroder, B. (2006). How smaller born-global firms use networks and alliances to overcome constraints to rapid internationalization. *Journal of International Marketing, 14*(3), 33–63.

Fuchs, C., Hofkirchner, W., Schafranek, M., Raffl, C., Sandoval, M., & Bichler, R. (2010). Theoretical foundations of the web: Cognition, communication, and co-operation. Towards an understanding of Web 1.0, 2.0, 3.0. *Future Internet, 2*, 41–59.

Gereffi, G., & Fernandez-Stark, K. (2011). *Global value chain analysis: A primer*. Durham: Duke University.

Hagen, B., & Zucchella, A. (2011). A longitudinal look at the international entrepreneurship dimensions: Cases and predictions. *International Journal of Management Cases, 13*(3), 484–504.

Hamill, J., Tagg, S., Stevenson, A., & Vescozi, T. (2010). Editorial. *Journal of Marketing Management, 26*(3–4), 181–186.

Hänninen, M., Smedlund, A., & Mitronen, L. (2017). Digitalization in retailing: Multi-sided platforms as drivers of industry transformation. *Baltic Journal of Management. 13*(2), 152–168.

Hendler, J. (2009). Web 3.0 emerging. *Computer, 42*, 111–113.

Hennart, J.-F. (2014). The accidental internationalists: A theory of born globals. *Entrepreneurship Theory and Practice, 38*(1), 117–135.

Hernández, V., & Nieto, M. J. (2015). Inward-outward connections and their impact on firm growth. *International Business Review, 25*(1), 296–306.

Hernández, V., & Pedersen, T. (2017). Global value chain configuration: A review and research agenda. *Business Research Quarterly, 61*, 1–14.

Johanson, J., & Vahlne, J. (1977). The internationalization process of the firm—A model of knowledge development and increasing foreign commitments. *Journal of International Business Studies, 8*(1), 23–32.

Kim, D. (2003). The internationalization of US internet portals: Does it fit the process model of internationalization? *Marketing Intelligence & Planning, 21*(1), 23–36.

Knight, G., & Cavusgil, S. T. (2004). Innovation, organizational capabilities and the born-global firm. *Journal of International Business Studies, 35*(2), 124–141.

Kuivalainen, O., Sundqvist, S., & Servais, P. (2007). Firms' degree of born-globalness, international entrepreneurial orientation and export performance. *Journal of World Business, 42*(3), 253–267.

Kundu, S. K., & Katz, J. H. (2003). Born international SMEs: Bi-level impacts of resources and intentions. *Small Business Economics, 20*(1), 25–49.

Lassila, O., & Hendler, J. (2007). Embracing "Web 3.0". *IEEE Internet Computing, 11*, 90–93.

Lee, S. H., DeWester, D., & Park, S. R. (2008). Web 2.0 and opportunities for small businesses. *Service Business, 2*(4), 335–345.

Li, J., Merenda, M., & Venkatachalam, A. R. (2009). Business process digitalization and new product development: An empirical study of small and medium-sized manufacturers. *International Journal of E-Business Research, 5*(1), 49.

Li, L., Qian, G., & Qian, Z. (2012). The performance of small and medium-sized technology-based enterprises: Do product diversity and international diversity matter? *International Business Review, 21*(5), 941–956.

Loane, S. (2006). The role of the internet in the internationalization of small and medium sized companies. *Journal of International Entrepreneurship, 3*(4), 263–277.

Lowy, A., & Hood, P. (2004). *The power of the 2×2 matrix: Using 2×2 thinking to solve business problem and make better decisions*. San Francisco: Jossey-Bass.

Lu, Q., & Liu, N. (2015). Effects of e-commerce channel entry in a two-echelon supply chain: A comparative analysis of single- and dual-channel distribution systems. *International Journal of Production Economics, 165*(C), 100–111.

Luo, Y., Hongxin Zhao, J., & Du, J. (2005). The internationalization speed of e-commerce companies: An empirical analysis. *International Marketing Review, 22*(6), 693–709.

Luostarinen, R. (1979). *Internationalization of the firm: An empirical study of the internationalization of firms with small and open domestic markets with special emphasis on lateral rigidity as a behavioral characteristic in strategic decision making*. Helsinki: The Helsinki School of Economics.

Madsen, T., & Servais, P. (1997). The internationalization of born globals: An evolutionary process. *International Business Review, 6*(6), 561–583.

Mahadevan, B. (2000). Business models for internet-based E-commerce: An anatomy. *California Management Review, 42*(4), 55–69.

Mahnke, V., & Venzin, M. (2003). The internationalization process of digital information good providers. *Management International Review, 43*(1), 115–142.

Mäki, K., & Hytti, U. (2008). *"Pitching out the lost cases"—A longitudinal study of the precedents of non-growth of recent incubator graduates*. ICSB world conference proceedings, Washington, DC.

Melén, S., & Nordman, E. R. (2009). The internationalisation modes of born globals: A longitudinal study. *European Management Journal, 27*(4), 243–254.

Musser, J., & O'Reilly, T. (2006). *Web 2.0 principles and best practices*. San Francisco, Sebastopol: O'Reilly Media. http://repo.mynooblife.org/.priv8/Ebook/Web%202.0%20Principles%20and%20Best%20Practices.pdf

Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. *Entrepreneurship Theory and Practice, 41*(6), 1029–1055.

O'Reilly, T. (2004). Web 2.0 conference.

O'Reilly, T. (2007). What is Web 2.0: Design patterns and business models for the next generation of software. Retrieved from MPRA, http://www-public.imtbs-tsp.eu/~gibson/Teaching/Teaching-ReadingMaterial/OReilly07.pdf. Accessed October 10th, 2017.

Ojala, A., & Tyrvainen, P. (2006). Business models and market entry mode choice of small software firms. *Journal of International Entrepreneurship, 4*(2), 69–81.

Oviatt, B., & McDougall, P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies, 25*(1), 45–64.

Oviatt, B., & McDougall, P. (2005). Defining international entrepreneurship and modeling the speed of internationalization. *Entrepreneurship Theory and Practice, 29*(5), 537–554.

Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance* (Vol. 1). New York: Free Press.

Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal, 12*(S2), 95–117.

Porter, M. E., & Kramer, M. (2011). The big idea: Creating shared value. How to reinvent capitalism—And unleash a wave of innovation and growth. *Harvard Business Review, 89*(1–2), 62–77.

Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review, 63*(4), 149–160.

Power, B. (2014). How GE applies lean startup practices. Retrieved from Culture Harvard Business Review, https://hbr.org/2014/04/how-ge-applies-lean-startup-practices. Accessed October 10th, 2017.

Reuber, R. (2016). *Multilingualism and the internationalization of firms in digital markets*. 43rd AIB-UKI, Department of Management Birkbeck, University of London, London.

Saarenketo, S., Puumalainen, K., Kuivalainen, O., & Kyläheiko, K. (2004). Dynamic knowledge-related learning processes in internationalizing high-tech SMEs. *International Journal of Production Economics, 89*(3), 363–378.

Shaw, V., & Darroch, J. (2004). Barriers to internationalisation: A study of entrepreneurial new ventures in New Zealand. *Journal of International Entrepreneurship, 2*(4), 327–343.

Singh, N., & Kundu, S. K. (2002). Explaining the growth of E-commerce corporations (ECCs): An extension and application of the eclectic paradigm. *Journal of International Business Studies, 33*(4), 679–697.

Sinkovics, N., Sinkovics, R. R., & "Bryan" Jean, R.-J. (2013). The internet as an alternative path to internationalization? *International Marketing Review, 30*(2), 130–155.

Styles, C., & Genua, T. (2008). The rapid internationalization of high technology firms created through the commercialization of academic research. *Journal of World Business, 43*(2), 146–157.

Su, N. (2013). Internationalization strategies of Chinese IT service suppliers. *MIS Quarterly, 37*(1), 175–200.

UNCTAD. (2017). World investment report. Investment and the digital economy. United Nations conference on trade and development. Geneva.

Wentrup, R. (2016). The online–offline balance: Internationalization for Swedish online service providers. *Journal of International Entrepreneurship, 14*(4), 562–594.

Yamin, M., & Sinkovics, R. R. (2006). Online internationalisation, psychic distance reduction and the virtuality trap. *International Business Review, 15*(4), 339–360.

Zhu, H., & Qian, G. (2015). High-tech firms' international acquisition performance: The influence of host country property rights protection. *International Business Review, 24*(4), 556–566.

PUBLICATION III

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S.
The role of digitalization on the internationalization strategy of born-digital companies

Accepted to the *47th Academy of International Business UK & Ireland Chapter Conference*, Adam Smith Business School, University of Glasgow
2-4 April 2020

PUBLICATION IV

Vadana, I.-I., Torkkeli, L., Kuivalainen, O., & Saarenketo, S.

The impact of digitalization of value-chain activities on international performance of born-digital companies

Accepted to the *47th Academy of International Business UK & Ireland Chapter Conference*, Adam Smith Business School, University of Glasgow
2-4 April 2020

ACTA UNIVERSITATIS LAPPEENRANTAENSIS

888. RANTALA, TERO. Operational level performance measurement in university-industry collaboration. 2019. Diss.

889. LAUKKANEN, MINTTU. Sustainable business models for advancing system-level sustainability. 2019. Diss.

890. LOHRMANN, CHRISTOPH. Heuristic similarity- and distance-based supervised feature selection methods. 2019. Diss.

891. ABDULLAH, UMMI. Novel methods for assessing and improving usability of a remote-operated off-road vehicle interface. 2019. Diss.

892. PÖLLÄNEN, ILKKA. The efficiency and damage control of a recovery boiler. 2019. Diss.

893. HEKMATMANESH, AMIN. Investigation of EEG signal processing for rehabilitation robot control. 2019. Diss.

894. HARMOKIVI-SALORANTA, PAULA. Käyttäjät liikuntapalvelujen kehittäjinä - Käyttäjälähtöisessä palveluinnovaatioprosessissa käyttäjien tuottama tieto tutkimuksen kohteena. 2020. Diss.

895. BERGMAN, JUKKA-PEKKA. Managerial cognitive structures, strategy frames, collective strategy frame and their implications for the firms. 2020. Diss.

896. POLUEKTOV, ANTON. Application of software-defined radio for power-line-communication-based monitoring. 2020. Diss.

897. JÄRVISALO, HEIKKI. Applicability of GaN high electron mobility transistors in a high-speed drive system. 2020. Diss.

898. KOPONEN, JOONAS. Energy efficient hydrogen production by water electrolysis. 2020. Diss.

899. MAMELKINA, MARIA. Treatment of mining waters by electrocoagulation. 2020. Diss.

900. AMBAT, INDU. Application of diverse feedstocks for biodiesel production using catalytic technology. 2020. Diss.

901. LAAPIO-RAPI, EMILIA. Sairaanhoitajien rajatun lääkkeenmääräämistoiminnan tuottavuuden, tehokkuuden ja kustannusvaikuttavuuden arviointi perusterveydenhuollon avohoidon palveluprosessissa. 2020. Diss.

902. DI, CHONG. Modeling and analysis of a high-speed solid-rotor induction machine. 2020. Diss.

903. AROLA, KIMMO. Enhanced micropollutant removal and nutrient recovery in municipal wastewater treatment. 2020. Diss.

904. RAHIMPOUR GOLROUDBARY, SAEED. Sustainable recycling of critical materials. 2020. Diss.

905. BURGOS CASTILLO, RUTELY CONCEPCION. Fenton chemistry beyond remediating wastewater and producing cleaner water. 2020. Diss.

906. JOHN, MIIA. Separation efficiencies of freeze crystallization in wastewater purification. 2020. Diss.

907. VUOJOLAINEN, JOUNI. Identification of magnetically levitated machines. 2020. Diss.

908. KC, RAGHU. The role of efficient forest biomass logistics on optimisation of environmental sustainability of bioenergy. 2020. Diss.

909. NEISI, NEDA. Dynamic and thermal modeling of touch-down bearings considering bearing non-idealities. 2020. Diss.

910. YAN, FANGPING. The deposition and light absorption property of carbonaceous matter in the Himalayas and Tibetan Plateau. 2020. Diss.

911. NJOCK BAYOCK, FRANCOIS MITERAND. Thermal analysis of dissimilar weld joints of high-strength and ultra-high-strength steels. 2020. Diss.

912. KINNUNEN, SINI-KAISU. Modelling the value of fleet data in the ecosystems of asset management. 2020. Diss.

913. MUSIKKA, TATU. Usability and limitations of behavioural component models in IGBT short-circuit modelling. 2020. Diss.

914. SHNAI, IULIIA. The technology of flipped classroom: assessments, resources and systematic design. 2020. Diss.

915. SAFAEI, ZAHRA. Application of differential ion mobility spectrometry for detection of water pollutants. 2020. Diss.

916. FILIMONOV, ROMAN. Computational fluid dynamics as a tool for process engineering. 2020. Diss.

917. VIRTANEN, TIINA. Real-time monitoring of membrane fouling caused by phenolic compounds. 2020. Diss.

918. AZZUNI, ABDELRAHMAN. Energy security evaluation for the present and the future on a global level. 2020. Diss.

919. NOKELAINEN, JOHANNES. Interplay of local moments and itinerant electrons. 2020. Diss.

920. HONKANEN, JARI. Control design issues in grid-connected single-phase converters, with the focus on power factor correction. 2020. Diss.

921. KEMPPINEN, JUHA. The development and implementation of the clinical decision support system for integrated mental and addiction care. 2020. Diss.

922. KORHONEN, SATU. The journeys of becoming ang being an international entrepreneur: A narrative inquiry of the "I" in international entrepreneurship. 2020. Diss.

923. SIRKIÄ, JUKKA. Leveraging digitalization opportunities to improve the business model. 2020. Diss.

924. SHEMYAKIN, VLADIMIR. Parameter estimation of large-scale chaotic systems. 2020. Diss.

925. AALTONEN, PÄIVI. Exploring novelty in the internationalization process - understanding disruptive even. 2020. Diss.

ISBN 978-952-335-570-5
ISBN 978-952-335-571-2 (PDF)
ISSN-L 1456-4491
ISSN 1456-4491
Lappeenranta 2020