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Digital Enterprises:
The Drivers of their
Internationalization Processes

DOCTORAL DISSERTATION

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ABSTRACT

Digital Enterprises: The Drivers of their Internationalization Processes

This dissertation addresses the key drivers of born digital firms' internationalization from two research perspectives: both the role of digital entrepreneurs and digital business models are utilized in this study. Entrepreneurs' capabilities to discover and create opportunities and their decision-making processes are argued as being central to understanding the firm's international growth. By following Digital Entrepreneurship (DE) research and effectuation theories, and the integration with International Entrepreneurship (IE) research, this dissertation reveals new insights on how the entrepreneurs' capabilities and their decision-making logic are fundamental drivers in recognizing international opportunities. Regarding Digital Business Models' (DBMs) theories, the study utilizes theoretical perspectives rooted in International Business (IB) and International Entrepreneurship (IE) research fields to examine some salient factors as key drivers in creating and capturing value on born digital firms' international growth. The study uses a conceptual and qualitative methodological design by combining longitudinal and qualitative single case study on born digital entrepreneurs with a multiple case study on DBMs to generate empirical findings on born digital firms' internationalization patterns.

The study unravels new insights of born digital firms' internationalization related to the specific objectives of this thesis: born digital firms need to be considered as forming a heterogeneous group. It is crucial to take into account the different typologies of digital firms' BM for a deeper explanation of their international growth. Although the impact of digital technologies to grow internationally is indubitable, the concept of globalized digital business model based on uniformity that embodies the non-location-bound firm-specific advantages to be replicated must be scrutinized carefully in a digital context. The study demonstrates that born digital firms may face costs and challenges in dealing with local contexts in their internationalization, and, therefore, they are not inherently global. The role of e-entrepreneurs in born digital firms' competitive strategies and international expansion is an important driver in explaining born digital firms' early internationalization.

The study contributes to IE, IB and DE research fields by underscoring the importance of e-entrepreneurs' capabilities and DBMs' characteristics as avenues to seek useful information provide meaning and deepen empirical discussions of how born digital firms reach their internationalization.

The dissertation offers valuable recommendations to entrepreneurs and managers on how to take advantage of key drivers as they internationalize.

Keywords: *Born Digital Firms, Digitalization, Internationalization, International Opportunity Recognition, Effectuation, Business Model*

CHAPTER 1

General Overview of the Dissertation

1. Problem statement

The use of advanced digital Information and Communication Technologies (ICTs) allows companies to identify opportunities for improvement, provide challenges to growth and share international activities. Digitalization is transforming how International Business is conducted (Coviello, Kano and Liesch, 2017; Alcácer, Cantwell and Piscitello, 2016; Vahlne and Johanson, 2017). Digitalization enables some firms to reach high levels of internationalization very rapidly and with limited investment in foreign assets (The United Nations Conference on Trade and Investment (UNCTAD, 2017).

The phenomenon of digital firms and their internationalization has been investigated by researchers in the last two decades regarding the impact of the Internet and digital technologies (e.g., IoT-Internet of Things, big data and analytics, robotic systems, and artificial intelligence) on the ways that firms operate and create value in international markets (Brouthers, Geisser, and Rothlauf, 2016; Wentrup, 2016; Chen, Shaheer, Yi, and Li, 2019). Nevertheless, studies on digital firms published in the last two decades suffer from a lack of clarity in the adoption of definitions of born digital firm and their internationalization processes, by including different samples of Internet-related firms such as ibusiness (Brouthers et al., 2016), high-tech firms (Almor, Tarba, and Margalit, 2014; Ojala and Tyrvaainen, 2006), digital information goods providers (Mahnke and Venzin, 2003; Wentrup, 2016), new technology-based firms (Bell and Loane, 2010; Campos et al., 2009; Mahadevan, 2000; Reuber, 2016), accidental internationalists (Hennart, 2014), or application service providers (Susarla, Barua, and Whinston, 2003). As one of the implications, this study aims at serving as a summary and starting point for scholars and practitioners interested in internationalized digital firms' phenomenon by providing several criteria for the definition and conceptualization of born digital companies, which increases research clarity within International Business and International Entrepreneurship research fields.

This doctoral dissertation focuses on the internationalization of so-called born digital firms, using the definition of a firm that “relies on the Internet for its production, operating and delivery

processes” (Monaghan et al., 2020). Born digital firms leverage digital technologies to provide their digital products and services to customers worldwide over the Internet (Brouthers, Geisser, and Rothlauf, 2016; Ojala, Evers, and Rialp, 2018; Vadana, Torkkeli, Kuivalainen, and Saarenketo, 2019) from inception. Digital products and services can easily be exported to remote markets because globe-spanning internet-based distribution channels, such as app stores and online platforms, permit nearly costless and instantaneous delivery (Hennart, 2014; Mahnke and Venzin, 2003; Bharadwaj, El Sawy, Pavlou and Venkatraman, 2013; Autio, Mudambi and Yoo, 2021). Indeed, recent International Entrepreneurship (IE) and International Business (IB) literatures suggest that born digital firms tend to be International New Ventures (INVs) or born-global firms (BGFs) (Autio et al., 2018; Brouthers et al., 2016), because their products are “instantly accessible from anywhere in the world” (Brouthers et al., 2016, p. 514). Some studies argue that the behaviour of born digital firms might deviate considerably from what the Uppsala model predicts (Forsgren and Hagström, 2007).

More recently, however, several researchers have pointed out that born digital firms follow different patterns of internationalization of INVs or born-global firms, arguing that digital firms face costs and difficulties in the local contexts where they operate (Stallkamp and Schotter, 2021; Verbeke and Hutzschenreuter, 2021), especially those related to overestimating the non-location-boundedness of firm-specific advantages (FSAs). Some scholars propose that born digital firms are not immune to differences between countries in terms of cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede virtual internationalization (Shaheer and Li, 2020). Other studies indicate that early internationalization and subsequent foreign market entries are governed by layered modular architecture, (Ojala, Evers, and Rialp, 2018), and its dependent on the platform provider`s capability to replicate a workable architecture stack in a target country. Hence, IB and IE research fields face two divergent conceptualizations of born digital firms` internationalization. There seems to be significant heterogeneity in the extent to which born digital firms achieve global reach (Mahnke and Venzin, 2003; Bell and Loane, 2010; Chen, Shareer, Yi, and Li, 2019), by suggesting that a holistic approach of the company might be valuable to identify the key elements of its international growth. Moreover, there is little empirical evidence on whether born digital firms internationalize faster or slower than non-digital firms, and the underlying drivers of why some born digital ventures internationalize faster than others.

For this purpose, the digital business model approach seems to be a suitable framework for fulfilling the objectives of this research. Although there are still few academic publications

regarding how digitalization of the business model affects born digital firms' internationalization, the number of articles is widely increasing in IB, and IE research fields as are opportunities for future research. To address these gaps, our research focuses on digital business model framework by providing useful lens through which to analyse the complex and dynamic internationalization processes that born digital firms may need to develop. The business model (BM) concept itself is yet a relatively new field of research, and it has since been accepted as an object of interest in Information Systems (IS) research (Osterwalder et al., 2005; Veit et al., 2014). Digital technologies have triggered the emergence of new business models as a new way of how firms organize for value creation, delivery, and capture (Baskerville, Myers, and Yoo, 2020; Autio, 2017). Therefore, digitalization provides a rich context to further understand business model-based development and its implication for IB and IE theories. This study was conducted to close some of the gaps in the literature by analyzing several typologies of digital business models (e.g., platforms, web and mobile apps, e-commerce) and how such companies internationalize. Accordingly, we contribute to and expand on existing International Business and International Entrepreneurship fields literature and theory in several ways. First of all, we contribute to the International Entrepreneurship literature by revealing how different typologies of born digital firms' business model are developed in a way to internationalize in a digital context. Secondly, we contribute to internationalization theories by examining the internationalization patterns among born digital firms in order to identify whether their internationalization paths differ or not from each other. Finally, our study responds to calls of research for advancing the drivers on born-digital start-ups internationalization at firm level.

Most of the rather scarce studies on born digital firms' internationalization are based on digital capabilities at firm level (Brouthers et al., 2016; Coviello, Kano and Liesch, 2017; Cahen and Borini, 2020; Monaghan et al., 2020). Research is still scarce in analyzing born digital firms' internationalization at individual level. Extant IE literature has yet to systematically analyse how specific entrepreneur's capabilities are developed in a way to enable international opportunity recognition of an increased number of emerging born digital companies. It must be taken into account that the fact of being a born digital firm might create new forms of internationalization through digital sales, digital users, and digitally interconnected partnerships. Digital entrepreneurs could develop capabilities that are different from those of non-digital entrepreneurs. Digital technologies create more variability in entrepreneurial activities and allow entrepreneurs to rapidly and easily enhance their capabilities and performance to create value (Nambisan, 2017). In this context, the research stream of Digital Entrepreneurship has emerged as an intersection between digital technologies and entrepreneurship literature. Some scholars suggest that the capabilities required in undertaking the digital entrepreneurial process may also be different,

because the digital entrepreneur faces increasingly dynamic paths, determined by diverse activities with uncertain time frames (Nambisan, 2017; Kraus et al., 2019; Hull et al., 2007). However, research is still scarce in identifying and understanding how the digital entrepreneurs' capabilities are developed in a way to enable a new venture to explore and exploit international opportunities in a digital context (Glavas, Mathews and Bianchi, 2017; Zaheer, Breyer, Dumay and, Enjeti, 2018; Dillon et al., 2020). In this respect, this is one of the areas requiring further research in both International and Digital Entrepreneurship literature. In addition, due to the novelty of the phenomenon of born digital firms and their internationalization, the entrepreneurs' decision-making process to recognize and exploit international opportunities seems understudied in IE research. Following the research stream on effectuation (Sarasvathy, 2001, 2008), this research posits that digital entrepreneurs develop specific capabilities (Schweizer, Vahlne, and Johanson, 2010) at the stage of starting new businesses and/or acting under high uncertainty, that influence their decision making-logic to recognize international opportunities (Dew et al., 2009; Perry et al., 2012; Read et al., 2009; Sarasvathy, 2001). Further empirical studies on decision-making processes are needed in order to analyse how this type of decision-makers explore and exploit international opportunities. In the present study, we contribute to and expand on existing International and Digital Entrepreneurship in terms of both theory and practice in several ways. First of all, we contribute to the digital entrepreneurial process by revealing how the entrepreneurs' digital capabilities are developed in a way to explore and exploit international opportunities in a digital context. Secondly, we contribute to effectuation theory by examining entrepreneur's decision-making process to recognize international opportunities in a born digital start-up. Finally, our study responds to calls of research for advancing the drivers on born-digital start-up internationalization at individual level (Coviello, Kano and Liesch, 2017; Monaghan, Tippmann and Coviello, 2020; Mainela, Puhakka and Servais, 2014; Glavas, Mathews and Bianchi, 2017; Cahen and Borini, 2020).

Hence, extant literature has yet to systematically analyse what specific costs and challenges digital firms encounter and the implications for their internationalization, leaving critical gaps to explore, both at firm level and at individual level. Little research has been done to date on the emergence of such a new category/breed of enterprise/s that engages in increasingly digital entrepreneurship with digitalized Business Models.

2. Purpose and Research Objectives

This doctoral dissertation is devoted to understanding the key drivers of born digital firms and their international performance and seeks to understand the distinct paths of their internationalization. In this way, this thesis aims to contribute to developing of International and Digital Entrepreneurship research fields in an increasingly digitalized context.

The specific objectives of the dissertation are:

- 1) Analyze the content and evolution of the research in the fields of International Business and Entrepreneurship, to develop a more complete understanding on born digital firms' definition and their internationalization processes.
- 2) Determine how digital entrepreneurs' decisions drive the born digital start-up's international opportunity recognition and explore the role of digital capabilities possessed by the entrepreneurs.
- 3) Conceptualize digital business model' dimensions and their impact on born digital firms' internationalization. We theorize that certain digital business model characteristics play a central role in explaining international growth of born digital firms.
- 4) Investigate the heterogeneity of born digital companies' international growth by focusing on digital business model dimensions.

In connection with these objectives, this doctoral dissertation aims to address the following research questions, gathered into four groups.

The first group, related to the systematic literature review about born digital firms' definition and their internationalization, the questions are:

- Which are the underlying criteria for considering what might be a born digital firm?
- What is the relevance of the studies about born digital firms' internationalization according to such criteria in IB and IE research fields?

The second group, related to digital entrepreneurs' capabilities and their decision-making logic at recognizing international opportunities, are:

- How and why do entrepreneur's digital capabilities affect international opportunity recognition in a digital context?

- How is digital entrepreneurs' decision-making logic applied in order to recognize international opportunities in a born digital firm?

Thirdly, related to the relationship between digital business model' dimensions and their impact on the internationalization of born digital firms is:

- How should a theoretical framework for a differentiated analysis of born digital firms' internationalization be set up according to digital business model dimensions?

The fourth group related to the heterogeneity of born digital companies' international growth, are:

- How do digital business models' dimensions impact on international growth of born digital firms?
- Why do some born digitals firms internationalize faster than others in accordance with their digital business models' characteristics?

3. Theoretical Background

This doctoral dissertation aims to explore the key drivers of born digital firms' internationalization in four interconnected articles from two complementary research perspectives: at individual level and at firm level. At individual-level approach by analyzing entrepreneurs' digital capabilities and their decision-making logic at recognizing international opportunities. The firm-level perspective focuses on digital business model framework by providing a holistic approach through which to analyze the complex and dynamic internationalization processes that born digital firms may need to develop.

The systematic literature review analyzed in the first article reveals that studies on digital firms published in the last two decades suffer from a lack of clarity in the adoption of definitions of born digital firms. Given this lack of consensus on born digital firms' definition, this doctoral dissertation adopts the term "born digital firm" to denote (1) firms whose digital business models are based on digital Information and Communication Technologies (ICTs) (e.g., big data, robotics, artificial intelligence, among others), (2) the firm's products or services can be marketed and sold by relying on digital infrastructures (the Internet, email, etc.), (3) the firm's products or services can be delivered by relying on digital infrastructures (the Internet, email, etc.) (4) these firms are digital from inception, and, (5) these firms provide digital goods and services. There are many different types of digital goods and services provided through digital firms. Some of the services or goods are purely digital whereas some of the services or goods combine both digital

and physical components (Gabrielson et al., 2021). In their study, Gabrielson et al. (2021) point out that it is necessary to distinguish and clearly define different typologies of firms approaching international markets and deploying digitalization in some or many of their business functions for a better understanding of their international earliness.

Moreover, as mentioned above, extant International Business (IB) and International Entrepreneurship (IE) research on digital firms has applied two broad types of internationalizations process theories: the Uppsala model, as well as the more recent theory on International New Ventures (INVs) and born global firms (BGF). These two divergent conceptualizations of born digital firms' internationalization postulated by IB and IE research fields are based on how such firms are structured, how firms interact with users, and how innovations are fostered globally (Brouthers, et al., 2016; Nambisan, 2017; Onetti et al., 2012). Based on the review of literature, it is quite evident the significant heterogeneity in the extent to which born digital firms achieve international growth (Mahnke and Venzin, 2003; Bell and Loane, 2010; Chen, Shareer, Yi, and Li, 2019).

Thus, both due to the lack of consensus in the definition of born digital firms and the divergent conceptualizations in IB and IE research fields about their internationalization processes, this thesis explores the drivers of the internationalization of digital companies by providing insights from e-entrepreneurs at recognizing international opportunities and their decision making-logic, as well as from different typologies of born digital firms' business models approaching international markets.

Entrepreneurs' capabilities to discover and create opportunities and their decision-making processes are argued as being central to understanding the firm's international growth (Mainela et al., 2014; Andersson and Evers, 2015). Nonetheless, extant IE literature has yet to systematically analyse how specific entrepreneur's capabilities are developed in a way to enable international opportunity recognition of born digital companies. In this context, the research stream of Digital Entrepreneurship has emerged as an intersection between digital technologies and entrepreneurship literature. Therefore, importing concepts from the Digital Entrepreneurship literature is much needed in the context of understanding internationalization of born digital firms so as to help capture the digital capability-building approach on an individual level in this case, the digital entrepreneur or e-entrepreneur. In addition, following the research stream on effectuation (Sarasvathy, 2001, 2008), this research posits that digital entrepreneurs develop specific capabilities (Schweizer, Vahlne, and Johanson, 2010) at the stage of starting new businesses and/or acting under high uncertainty, that influence their decision making-logic to recognize international opportunities (Dew et al., 2009; Perry et al., 2012; Read et al., 2009;

Sarasvathy, 2001). Therefore, the effectuation approach where entrepreneurs' actions convert uncertainties into opportunities (Mainela et al., 2014) help us to understand the role played by the entrepreneurs' capabilities at recognizing international opportunities, and, in turn, how these capabilities influence the quality of their managerial decisions (Anderson and Evers, 2015). Moreover, this research aims to clarify how the disruptive nature of digital technology imposes an entrepreneurs' digital start-up mindset, and how an uncertain digital environment calls for continual effectuation actions by e-entrepreneurs. In our study, we refer to the digital capability-building approach on an individual level as a "digital start-up mindset" following the definition according to Zaheer et al.'s (2018), jointly with entrepreneurs' international experience acquired through the deployment of digital technologies (Dillon et al., 2020). Our research highlights how the capabilities required in undertaking the digital entrepreneurial process may also be different (Nambisan, 2017).

Hence, following Digital Entrepreneurship literature and effectuation theories, this doctoral thesis explores the role of e-entrepreneurs as a key driver on born digital firms' internationalization at individual level.

From the firm-level approach, this dissertation focuses on digital business model framework as a holistic approach in order to analyze the complex and dynamic internationalization processes that born digital firms may need to develop. The business model (BM) concept itself is yet a relatively new field of research, and it has since been accepted as an object of interest in Information Systems (IS) research (Osterwalder et al. 2005; Veit et al. 2014). Despite the growing importance of this concept, the literature on BMs is fragmented and heterogeneous. This definitional ambiguity suggests a need to conceptualize the BM more formally, and to distinguish it from the business strategy, supporting processes and metrics, thus separating and de-layering it from the multi-layer business decision process (Osterwalder et al., 2005). Moreover, there are few definitions in the IS literature that attempted to deliver a precise definition of a digital business model. In this thesis, we follow the definitions coined by (Osterwalder et al., 2005; Osterwalder and Pigneur, 2010) and Teece (2010), considering that BMs can be broken down into three key-value dimensions: value proposition, value creation and delivery and value capture (Teece, 2010; Clauss, 2017). Besides, this thesis is grounded on the assumption that the value dimensions of a BM are interdependent, that is, the combination of the three value mechanisms forms the globality of a firm's BM (Shafer et al., 2005; Clauss, 2017).

Thus, the business model represents a relatively formal illustration of how a firm integrates its core activities with location and modality, drawn together by its strategic and operational

intentions. Indeed, previous research on business models has stimulated new reflections on the mechanisms and factors that drive digital firms to engage and enhance their innovations outcomes and processes to internationalize (Onetti, Zuchella, Jones, and McDougall-Covin, 2012). A recent emerging theme pertains to impact of Business Models components on born digital firms' internationalization. This new-born research stream has suggested new theoretical frameworks on key-value dimensions of born digital ventures' business models to internationalize (Brouthers, et al., 2016; Hazarbassanova, 2016; Yonatany, 2017; Strange and Zuchella, 2017; Witkop, et al., 2018; Hänninen, et al., 2017; Vadana, et al., 2019; Gabrielson, et al., 2021; Mac Cathmhaoil, et al., 2021). In this sense, the business model concept can help provide a structure to the large number of variables in the IB and IE theories. A differentiation in the value proposition, value creation and delivery, and value capture is recommendable as a framework for a differentiation of internationalization strategies among different types of born digital firms. On this theoretical basis provided, it is possible to develop a comprehensive understanding of how born digital companies are internationalizing and why their internationalization processes differ from each other attending their business model components.

Figure 1 depicts the theoretical background of the study within the literature. It indicates the relationships between the born digital ventures and research field tackled in this thesis. The research gap that this thesis aims to respond to arises at the intersection of the research on the internationalization and digitalization, both at firm level and individual level, of born digital firms. Therefore, it includes elements from Digital Entrepreneurship, and Information Systems literature, both rooted in IB and IE research fields.

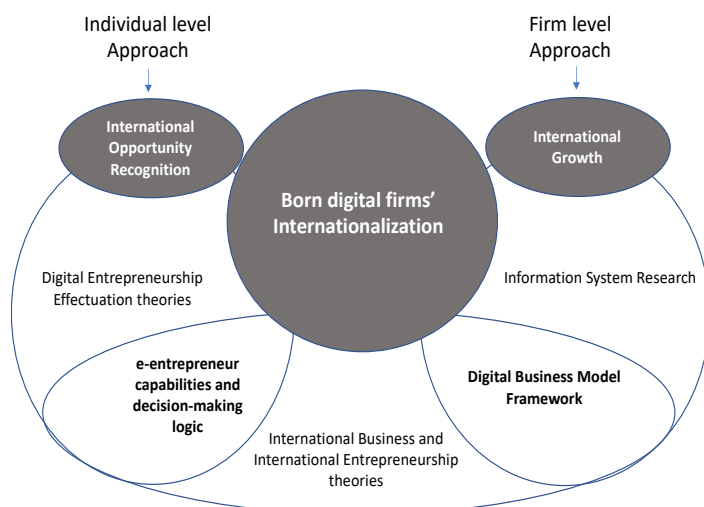


Figure 1. Theoretical background of the thesis

4. Structure and Main Contents of this dissertation

This doctoral dissertation is organized into six chapters. Table 1 shows the specific research aim, the contributions of each study, the theoretical foundation will apply and the methodology to enforce in the respective study.

The first introductory chapter assists in defining the general research idea and overview of the research purpose, questions and objectives that will be answered in the main body of this thesis. A systematic literature review to examine the extant research in International Business and International Entrepreneurship is presented in the second chapter. The third chapter conducts an in-depth investigation of International Opportunity Recognition in a born digital Start-up based on how entrepreneurs' decisions drive the new firm's internationalization behaviour and explores the role of digital capabilities possessed by the e-entrepreneurs. A qualitative and interpretive method is used for this purpose in a longitudinal single case setting. The fourth chapter is a conceptual paper by looking at born digital firms' business model main characteristics and the current literature around digital firms' international growth. In this article, we develop a theoretical framework to guide future research drawing from a digital business model perspective. The fifth chapter develops a comprehensive understanding of how born digital firms internationalize in the digital market, and why their internationalization could differ from one another. In seeking to explain heterogeneity in the internationalization of born digital companies, we focus on digital business model dimensions that have not been sufficiently considered in prior research. An inductive research approach, based on a qualitative multiple case study is use for this purpose. Finally, the sixth chapter consists of the final conclusions of the research. More specifically, final theoretical and managerial contributions, study limitations, and recommendations for future research are presented.

	Objective	Research Questions	Theoretical Framework	Methodology
Chapter 1:	Summary of the main purposes, motivation, theoretical background, structure and contents of the dissertation			
General Overview of the Dissertation				
Chapter 2: Digital Internationalizing Firms (DIFs): A Systematic Literature Review and Future Research Agenda	To analyse the content and evolution of the research on born digital firms and their internationalization, to identify the themes that recurred during the last two decades, and to highlight trends and future research	Which are the underlying criteria for considering what might be a 'born digital' firm? What is the relevance of the studies about born digital firms' internationalization according to such criteria in IB and IE research fields?	International Business and International Entrepreneurship	Systematic Literature Review and Future Research Agenda
Chapter 3: Recognizing International Opportunities by Born-digital Entrepreneurs: A Qualitative Approach	To analyse International Opportunity Recognition in a Born Digital Start-up based on how entrepreneurs' decisions drive the new firm's internationalization behaviour and to explore the role of digital capabilities possessed by the entrepreneurs	How and why do entrepreneur's digital capabilities affect international opportunity recognition in a digital context? How is digital entrepreneurs' decision-making logic applied in order to recognize international opportunities in a Born Digital Firms?	International Entrepreneurship, Digital Entrepreneurship, Effectuation Theories	Qualitative and interpretive method in a longitudinal single case setting
Chapter 4: International Growth of Born Digital Firms: Thoughts on Digital Business Models' Dimensions	By looking at born digital firms' business model main characteristics and the current literature around born digital firms' international growth, to develop a framework to guide future research drawing from a digital business model perspective	How should a theoretical framework for a differentiated analysis of born digital firms' international growth be set up according to digital business model dimensions?	International Business, International Entrepreneurship, and Information System	Conceptual
Chapter 5: Factors influencing Born Digital Firms' International Growth: A Qualitative Approach on Business Models	To develop a comprehensive understanding of how born digital firms internationalize in the digital market, and why their internationalization could differ from one another. To focus on digital business model dimensions in seeking to explain heterogeneity in the internationalization of born digital companies.	How do digital business models' dimensions impact on international growth of born digital firms? Why do some born digital firms internationalize faster than others in accordance with their digital business models' characteristics?	International Business, International Entrepreneurship, and Information System	Qualitative and inductive research in a multiple case study
Chapter 6: Conclusions, Limitations, and Future Research	Summary of the main findings, theoretical and practical implications, limitations and future research agenda			

Table 1. Structure and main contents of the dissertation

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CHAPTER 2

Digital Internationalizing Firms (DIF'S): A Systematic Literature Review and Future Research Agenda

Abstract

This article analyzes the content and evolution of the research in the field of International Business and Entrepreneurship to describe the state of the art of the literature on born digital firms and their internationalization, to identify the themes that recurred during the last two decades, and to highlight trends and future research perspectives in these fields. We conducted a rigorous search of articles published in high impact journals. The main findings reveal that there is still no consensus on the definition of digital firms and their internationalization processes. Future research should advance in this aspect. Likewise, it is both needed and important to conduct more empirical research that analyze the international expansion of born digital firms and their internationalization patterns. In response to this, we examine in the extant literature how mainly digital companies base on their digital business models to internationalize. Although there are still few academic publications regarding how digitalization of the business model affects born digital firms' internationalization, the number of articles is widely increasing in the field of International Business and Entrepreneurship, as are opportunities for future research.

***Keywords:** digitalization, international business, international entrepreneurship, digital business models, Internet-based.*

1. Introduction

Digital technologies are disrupting traditional industries and the global economy. Examples of new information technologies infrastructures, Internet of Things (IoT), Artificial Intelligence (AI), Blockchain, High-speed internet and Wireless technology, and other information and communications technologies (ICTs) are generally referred to as “digitalization”.

To companies, digitalization means opportunities for transform and/or create new business models, spanning from marketing and sales channels to logistics. The use of advanced digital information and communications technologies allow companies to identify opportunities for improvement, provide challenges to growth and share international activities.

Digitalization is transforming how International Business (IB) is conducted (Coviello, Kano and Liesch, 2017; Alcácer, Cantwell and Piscitello, 2016; Vahlne and Johanson, 2017). Digitalization enables some firms to reach high levels of internationalization very rapidly and with limited investment in foreign assets (The United Nations Conference on Trade and Investment (UNCTAD, 2017).

Prior research indicates that digital firms may follow different internationalization patterns and adopt different operating modes that conventional firms (Autio and Zander, 2016; Mahnke and Venzin, 2003; Yamin and Sinkovics, 2006). Empirical studies suggest that the internationalization process of digital firms goes from regional to international, and finally global, using adaptations such as language translations to overcome barriers (Mahnke and Venzin, 2003; Brouthers et al., 2016). They position their products or services for a niche market, and they adapt very quickly to control it (Hennart, 2014; Autio, 2017). Other empirical studies on digital start-ups producing digital innovations (e.g., mobile apps) analyse how these firms base their businesses on online platforms or marketplaces to internationalize rapidly (Shaheer and Li, 2018). Using a high degree of digitalization of the value chain, digital companies coordinate the value chain activities with Internet-enabled technologies (Hennart, 2014; Hazarbassanova, 2016). The centre of decisions is generally the home country (Mahnke and Venzin, 2003). However, it is also argued that these companies prefer to enter international markets via controlled modes (e.g., subsidiaries) (Sinkovics, Sinkovics, and Jean, 2013). Based on this, digital companies cannot activate in a market without being partly present offline, in general, because of legal compliance and market-specific requirements (e.g., a dependence on local e-commerce merchants) (Wentrup, 2016). Moreover, these firms should deal with greater Liabilities of Outsidership (LoO), since the main concern is the creation of a large enough network of users to generate value on its platform and create thick ecosystems in new countries (Brouthers et al., 2016).

Unfortunately, studies on digital firms published in the last two decades suffer from a lack of clarity in the adoption of definitions and recent research includes different samples of Internet-related firms. Little research has been done regarding the emergence of a new type of digitalized (Internet-based) company (Bell and Loane, 2010; Brouthers et al., 2016; Wentrup, 2016), which bases its business model on the latest digital technologies. As a foundation for considering what

might be a “born digital” firm, we refer to UNCTAD (2017) to distinguish between Information and Communications Technology (ICT) firms and those that are digital.

In this sense, the aim of this paper is to contribute on this aspect by performing a systematic literature review of central academic papers analysing the content and evolution of the research in the fields of International Business and Entrepreneurship, to develop a more complete understanding of how born digital firms internationalize. Thus, the goals of the review are as follows: to describe the state of the art of the literature on born digital firms and their internationalization patterns, to identify the themes that recurred during the period 2000 and 2018, and to highlight trends and future research perspectives in the fields of International Entrepreneurship and International Business. As one of the implications, this study aims at serving as a summary and starting point for scholars and practitioners interested in internationalized digital firms’ phenomenon. Future research should advance in this aspect.

The main findings reveal that there is still no consensus on the definition of digital firms and their internationalization processes. In so doing, we attempt to discuss some shortcomings of research at a methodological and thematic level offering insights into how such limitations could be addressed. To achieve this, we structure this paper in six sections as follows. The initial theoretical framework is discussed in the second section. In section three, we present the methodology to analyse systematically the literature that uses digital dimensions as a framework in international business and international entrepreneurship research published in high impact journals between 2000 and 2018. The discussions based on the findings are given in section four and directions for future research are outlined in section five. Our conclusions are reported in the last section.

2. Theoretical Framework: Regarding Born Digital Firm definition and its internationalization process

2.1 Digitalization and Born Digital Firms

Extant research use different terms like ibusiness (Brouthers et al., 2016), high-tech firms (Almor, Tarba, and Margalit, 2014; Ojala and Tyrvaainen, 2006), digital information goods providers (Mahnke and Venzin, 2003; Wentrup, 2016), new technology-based firms (Bell and Loane, 2010; Campos et al., 2009; Mahadevan, 2000; Reuber, 2016), accidental internationalists (Hennart, 2014), or application service providers (Susarla, Barua, and Whinston, 2003), but they view digitalized companies as any firm operating online that provides its products/services to

customers using the Internet and other digital, IC-based technologies (Bell and Loane, 2010; Wentrup, 2016; Nambisan, 2017). Other authors define a digital firm as an organization where nearly all significant business processes and relationship with customers, suppliers, and employees are digitally enabled and mediated, and key corporate assets are managed through digital means (Laudon and Laudon, 2018). Digital firm offers extraordinary opportunities for more flexible global organization and management.

As we mentioned before, our foundation for considering what might be a ‘born digital’ firm, follows The United Nations Conference on Trade and Investment (UNCTAD), in its 2017 World Investment Report to distinguish between Information and Communications Technology (ICT) firms and those that are digital. ICT firms include manufacturers of hardware and components (e.g., Samsung, Toshiba), software and service firms (e.g., Oracle, Adobe Systems), or telecoms that provide the infrastructure for communication (e.g., Vodafone, Deutsche Telekom). In contrast, a digital firm relies on the internet for its production, operating and delivery processes. These include internet platforms (e.g., Alphabet, Yahoo, Facebook, Twitter) and providers of digital solutions (e.g., Automatic Data Processing, PayPal, Global Payments), that operate entirely in a digital environment, and e-commerce (e.g., Amazon, Alibaba, Expedia) and digital content firms (e.g., Comcast, Time Warner, Netflix, Spotify), that combine a prominent digital dimension with a physical one.

Therefore, to avoid confusion, we may adopt the term “born digital firm” to denote firms whose business models are based on digital ICTs (e.g., big data, robotics, artificial intelligence, among others), and whose products and services can be delivered virtually over the internet (Coviello et al., 2017; Mahnke and Venzin, 2003). Thus, these firms provide digital goods and services and may also possess a fully or partially digitalized value chain. Digital goods and services are broadly defined as “experience goods encoded as a string bits” (Mahnke and Venzin, 2003, pg.119): “the goods do not perish or require transportation; have no diminishing return to scale; have great benefits of economies of scale; might inherit network effects; might produce valuable data”. This particular type of firm has the above characteristics, and it is also digital from inception.

In this sense, we classify born digital firms in two main categories regarding their type of digital business model. The “purely born digital firms” which includes digital platforms, providers of digital solutions, and digital content producers/distributors of goods and services in digital format. In the second category called “mixed born digital firm” we include only full online and online-born commerce companies which are involved in both digital and physical products and services distribution, basically Internet retailers and e-commerce platforms. These definitions restrict the concept of digital firm to those companies whose business is digital. Therefore, ICT companies that provide the enabling infrastructure that makes the Internet accessible to individuals and

business (hardware, software and telecom firms) and e-commerce channel of traditional business and multichannel retailer are excluded.

2.2 Digital Internationalization process theories

Extant International Business (IB) research on digital firms has applied two broad types of internationalizations process theories: the Uppsala model, as well as the more recent theory on International New Ventures (INVs) and born global firms.

First formulated by Johanson and Vahlne in 1977, the Uppsala model, also known as the stage model or the U-model, is one of the most influential theories explaining firms' internationalization (Oviatt and McDougall, 2005; Schueffel et al., 2014). The internationalization is described as slow and incremental (Oviatt and McDougall, 2005), and the model assumes that the firm's overarching goal is to strive for growth and long-term profit while trying to keep risk taking at a low level (Madsen and Servais, 1997). At the time, IB was mainly developed for multinational enterprises (MNEs). Notably, Johanson and Vahlne (2009) have suggested several extensions and clarifications to their original model, emphasising the role of business networks and capability-creating processes (Vahlne and Johanson, 2017).

Within internationalization theory, the phenomenon of small and young firms internationalizing early has opened a new research stream. These firms do not follow the same patterns as traditional firms when internationalizing and many researchers sought to explain why using several theoretical frameworks.

This phenomenon has had many labels: "Born Globals" (Rennie, 1993; Rasmussen and Madsen, 2002), "Global Start-ups, (Oviatt and McDougall, 2005), "International New Ventures" (McDougall and McDougall, 2005; Servais and Rasmussen, 2000; Oviatt and McDougall, 2005; Autio, 2005; Coviello, 2006) and "International Entrepreneurship" (IE) (Oviatt and McDougall, 2005). Moreover, the IE approaches focus on internal factors, capabilities, and networks of a company as reasons for such behavior (Andersson, 2011; Hagen and Zucchella, 2014).

The recent literature suggests that digital firms tend to be INVs or born-global firms (Autio et al., 2017; Brouthers et al., 2016), because their products are "instantly accessible from anywhere in the world" (Brouthers et al., 2016, pg. 514). Compared to traditional modes of foreign market entry, virtual internationalization greatly reduces the cost and risk of expanding (Autio and Zhander, 2016). Digital products and services can easily be exported to remote markets, because the Internet permits nearly costless and instantaneous delivery (Hennart, 2014; Mahnke and Venzin, 2003). When value-adding, activities need to be performed in foreign markets, digital

ICTs often allow firms to externalize these operations by improving communication and monitoring (Autio and Zander, 2016; Dunning and Wymbs, 2001; Rangan and Sengul, 2009). Scholars have argued that these factors substantially reduce the need for market-seeking foreign direct investment (FDI) (Eden, 2016; UNCTAD, 2017). Digital firms are thought to pursue primarily ‘virtual’ internationalization, i.e., without establishing a physical presence in foreign markets (Singh and Kundu, 2002; Yamin and Sinkovics, 2006).

However, other studies indicate that digital firms follow different patterns of internationalization of INVs, and do not necessarily serve foreign markets from inception. For example, differences in terms of culture, languages, and consumer preferences, among others, may require modifications on products and services to suit local needs (Blum and Goldfarb, 2006, Shaheer and Li, 2017).

There seems to be significant heterogeneity in the extent to which digital firms achieve global reach (Mahnke and Venzin, 2003; Bell and Loane, 2010; Chen, Shareer, Yi, and Li, 2019). Thus, the applicability of the internationalization theories to digital ways of conducting business needs to be challenged.

3. Methodology

We adopted the basic guidelines for a systematic review set out by Tranfield, Denyer, and Smart (2003), identifying relevant articles through keyword searches in two journal databases. Scopus and Web of Science (WoS) were selected as our database due to their wider coverage of articles, highly adaptable search, and more refined options (Mongeon and Paul-Hus, 2016).

To comply with the objective of analyze the content and evolution of the research in the field of Born Digital Firms it was made a systematic literature review (Tranfield, Denyer, and Smart, 2003). This work systematically reviews articles published from 2000 to 2018. This time frame was selected on the assumption that research that is more than 18 years old probably does not collect all the key information in this technologically changing environment.

3.1 Search method and scope

The search criteria comprised articles investigating born digital firms published in the research fields of International Business and Entrepreneurship. Books, book chapters, and conference proceedings were excluded. The scope of the search is related to material published between 2000 and 2018 (both included). The selection of studies is the result of a methodological process that combined electronic means with manual search in two phases. We conducted a keyword search

in Scopus and Web of Science (WoS) using “international entrepreneurship,” “international business”, “digital firm,” and “digital business models” which are the most influential labels used to describe firms achieving “online internationalization” (Yamin and Sinkovics, 2006; Wentrup et al., 2016; Shaheer and Li, 2017). Six filters were applied for the initial searches: the studies included had to (1) be published in the period 2000-2018; (2) be classified as review, theoretical, or empirical academic article; (3) be the search result of Internet-based firms, digital firm, ebusiness, digital platform firm, digital entrepreneurship, ibusiness, digital business models, online internationalization, international business in the Article title, Abstract or Keywords field of the studies; (4) be identified as journal article; (5) appear in high impact journals in the topic Business and Management, and (6) be written in English. Although our systematic search was limited to these journals, our review included research published in other outlets when it was relevant to the discussion. Firstly, through the Scopus and WoS search, we obtained 146 articles published in high impact journals.

Since the goal of the review was to conduct an in-depth thematic analysis, we decide to refine and reduce the database articles obtained, by limiting our search to articles focused on 1) firms whose business models are based on digital ICT-based technologies and whose products and services can be delivered virtually over the Internet, (2) factors that encourage firms to use digital technologies to internationalize from inception; or 3) the characteristics of Internet use, at either the firm or the industry level. Each of these articles was read one by one to determine whether it added value to an enhanced understanding of born digital firms and the paths of their internationalization process. In this second phase, the articles that did not fulfilled the three limiting criteria (104 off-topic articles) were excluded. Some examples of excluded articles were those related to firms (SMEs and High Tech but not digitals) that have relied not only on Internet-based channels, but also used combinations of conventional channels and the Internet. This means that born digitals are fundamentally different from bricks-and-mortar firms that have “gone digital” by internalizing digital capabilities into the organization. They also differ from firms that are still in the process of “going digital” by engaging in digital transformation or augmenting their digital capabilities. The final dataset included 42 articles published in 26 journals referring to digital firms and their internationalization process, as shown in Table 1. The dataset of 42 articles is comprised of the 5 reviews, 15 conceptual studies, and 22 empirical studies, of which, 13 qualitative and 9 quantitative studies. The final selected studies are described in Table 2.

Journal	International Business	Entrepreneurship	Marketing	Management Information Systems	Management	Number
Journal of International Business Studies	7					7
International Business Review	4					4
Strategic Entrepreneurship Journal		3				3
Journal of Business Venturing		3				3
Management International Review	2					2
International Marketing Review			2			2
Journal of International Entrepreneurship		2				2
Strategic Management Journal					1	1
Entrepreneurship Theory and Practice		1				1
Multinational Business Review	1					1
Journal of Organization Design					1	1
Journal of World Business	1					1
Journal of Marketing Management			1			1
Management Dynamics in the Knowledge Economy	1					1
Journal of International Marketing			1			1
Information Systems Journal				1		1
Critical Perspectives on International Business	1					1
Entrepreneurial Business and Economics Review		1				1
Computers in Industry				1		1
Baltic Journal of Management					1	1
Canadian Journal of Administrative Sciences		1				1
Technological Forecasting & Social Change				1		1
Journal of International Management	1					1
Review of International Business & Strategy	1					1
MIS Quarterly				1		1
Journal Management Gov					1	1
Number	19	11	4	4	4	42

Table 1. Description of the number of articles published in each journal and Field

Table 2 Prior literature on different fields regarding Digital Firms and their Internationalization

Field	Studies	Typology of study/Sample	Aim/Research Question
International Business	De la Torre & Moxon, 2001	Conceptual	This study analyses the Impact of ICT conducting international Business.
Management	Amit & Zott, 2001	Qualitative. Sample: 59 american and european e-business	This article analyses Value creation in e-business based on efficiency, complementarities, lock-in and novelty.
International Business	Kotha, Rindova & Rothaermel, 2001	Quantitative Sample: 86 internet B2C firms (MNE)	Focus on Internalization theory, this article analyses how internationalize 86 pure internet firms Business to consumer base on Intangible assets (reputation and website traffic).
International Business	Singh & Kundu, 2002	Conceptual	This study contributes to IB theories identifying the variables affecting the growth of e-commerce corporations. The proposed framework in the study extends the explanatory eclectic paradigm in the context of e-business
International Business	Mahnke & Venzin, 2003	Qualitative Case Study (eBay)	This article examines how product characteristics shape the internationalization process of digital information good providers.
International Entrepreneurship	Loane, McNaughton, & Bell, 2004	Qualitative Case Study. Sample: 10 Irish Internet Start-ups	This paper explores the patterns, pace, and drivers of internationalization and the processes involved to determine the extent to which the Internet has influenced the firms' international activities, behaviour, and overall strategy.
International Marketing	Luo, Zhao & Du, 2005	Quantitative Sample: 93 US companies whose business activities are entirely internet-based from inception	This study aims to explain the internationalization speed of e-commerce companies (ECCs). Based on the archive data of the American ECCs, the study used multiple regression analysis to estimate the influences of many micro- and macro-factors.
International Business	Yamin & Sinkovics, 2006	Qualitative Exploratory case study Sample: 26 firms Engineering sector /United Kingdom's North-West region	This paper examines the effects of online internationalisation on the psychic distance perceptions of internationalising firms. Building on extant internationalisation literatures and exploratory interviews, the authors generate four propositions positing effects of online internationalisation on psychic distance.

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Table 2 Prior literature on different fields regarding Digital Firms and their Internationalization (Continue)

International Business	Forsgren & Hagström, 2007	Conceptual	The purpose of this paper is to examine to what extent classical models of firms' internationalization process can explain behaviour among totally new types of firms (Internet-related firms)
Management	Onetti, Zucchella, Jones, & McDougall-Covin, 2010	Literature review, conceptual Based on 70 definitions published from 1996 to 2009	This paper proposes a framework for the business model of new technology-based firms (those developed their business around a new technological platform). For these firms, strategic decisions and growth processes are characterized by a deep interrelationship amongst the processes of internationalization, innovation and entrepreneurship.
International Marketing	Bell & Loane, 2010	Literature Review	This paper analyses the emergence of a new type of firms "new wave of global small and medium firms". For these firms the Internet is a key driver of business development and speedy internationalisation.
International Entrepreneurship	Reuber & Fischer, 2011	Literature review, conceptual 33 journals published from 2000 to 2010	This paper shows a conceptual model based on online reputation, online technological capabilities, and online brand communities, developed through a comprehensive review of literature in diverse fields: entrepreneurship, international business, management, management information systems, and marketing.
International Business	Pezderka & Sinkovics, 2011	Conceptual	Analyze e-risk perceptions and implications for small firm active online internationalization/entry mode
International Marketing	Sinkovics, Sinkovics, & Jean, 2013	Quantitative. Sample: 115UK-based SMEs involved in active online internationalization	This paper examines the drivers and performance outcomes of two patterns of internet use supporting export marketing: the internet as an alternative to a physical presence and the internet as a sales channel. Specifically, it is unclear how the internet can successfully support export marketing.
International Entrepreneurship	Fisher & Reuber, 2014	Qualitative case study Sample: 8 entrepreneurial firms B2B	The purpose of this paper is reducing the gap in the current literature on entrepreneurial communications to know how growth-oriented entrepreneurial firms can use new media channels such as Twitter to reduce uncertainty and enhance differentiation.

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Table 2 Prior literature on different fields regarding Digital Firms and their Internationalization (Continue)

International Business	Brouthers, Geisser & Rothlauf, 2016	Qualitative Multiple case design Sample: 9 iBusiness firms (B2B, B2C, C2C)	This paper examines how the internationalization process of ibusiness firms will build on concepts dealing with social networks and diffusion theories to move from a user- network outsider to an insider and become embedded in the foreign market user community.
International Entrepreneurship	Wentrup, 2016	Qualitative Sample: 3 On-line Service Providers	This study explores how the On-Line Service Providers (OSPs) internationalize in terms of speed, geography and mode of entry. The paper introduces two theoretical concepts: the online-offline balance and online-to-offline interval.
International Business	Alcácer, Cantwell & Piscitello, 2016	Conceptual	The study examines the changing nature of the competitive advantages of places, the competitive advantages and strategies of firms, and the governance structure of International Business (IB) networks in what has been called the third industrial revolution.
International Business	Hazarbassanova, 2016	Qualitative case study Sample: 3 cases with a different value creation logic. Explore the differences in the scale and speed of their internationalisation (cross-case analysis)	This paper explores how the value creation logic of internet firms (IFs) influence their internationalisation process and they differ from traditional firms.
International Business	Shu, Morschett, & Swoboda, 2016	Quantitative Sample: 150 online retailers (1110 market entries in 47 country markets over 19 years)	This paper identifies and analyses various influence factors on internationalization speed of online retailers and their impact on individual internationalization steps. Grounded in the resource-based view, the paper examines the effects of imitability of an online shop, the presence of venture capitalists, the scope of the country portfolio and distance and diversity within the country portfolio on the internationalization speed of online retailers
International Entrepreneurship	Nambisan, 2017	Conceptual	This paper examines how the new digital technologies have transformed the nature of uncertainty inherent in entrepreneurial processes and outcomes.

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Table 2 Prior literature on different fields regarding Digital Firms and their Internationalization (Continue)

International Entrepreneurship	Etemad, 2017	Conceptual	This article analyses a conceptual multi-layered framework of international entrepreneurship by incorporating another encompassing layer to the framework, the rapidly emerging online global marketplace.
International Business	Strange & Zucchella, 2017	Conceptual	This paper aims to provide an assessment of how the widespread adoption of new digital technologies (i.e. the Internet of things, big data and analytics, robotic systems and additive manufacturing (3-D printing)) might affect the location and organisation of activities within global value chains (GVCs).
International Business	Coviello, Kano & Liesch, 2017	Conceptual	This study focusses on two critical dimensions absent from Vahlne and Johanson's (2017) arguments: the impact of the digital context as a defining macro-level feature of the modern world, and the role of the individual as a core microfoundation of the internationalization process.
Management	Nambisan, Lyytinen, Majchrzak, & Song, 2017	Conceptual	This is an introductory paper whose objective is to lay bare the broader implications of digital innovation for research in innovation management. How should organizations engage in and enhance their innovation outcomes and processes in the digital world.
International Entrepreneurship	Amit & Han, 2017	Conceptual	This study proposes a new conceptualization of a firm's resource configuration decision in a digitally enabled world. The digitalization of businesses allows entrepreneurs and managers alike to reimagine the boundary of their resource configurations and, thereby, enhance the value-creation potential of resources.
Management	Li, Su, Zhang & Mao, 2017	Qualitative Sample: 7 SMEs e-commerce on the Alibaba Digital Platform.	This research investigates how entrepreneurs of small and medium enterprises (SMEs) with inadequate capabilities and limited resources drove digital transformation in their companies.

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Table 2 Prior literature on different fields regarding Digital Firms and their Internationalization (Continue)

International Entrepreneurship	Autio, 2017	Conceptual	This article presents a normative framework (Strategic Entrepreneurial Internationalization) that articulates how INVs can leverage internationalization to drive competitive advantage.
International Business	Schu & Morschett, 2017	Quantitative. Sample: 140 online retailers in Europe	This article examines the foreign market selection on on-line retailers. These authors define a path dependent perspective on influence factors.
Management	Yonatany, 2017	Conceptual	This paper proposes a theoretical link between International Business theory and the literature related to the platform-ecosystem organizational form. It emphasizes implications for psychic distance, liability of foreignness, and speed and pattern of internationalization.
International Entrepreneurship	Parente, Geleilate and Rong, 2018	Conceptual	This article focusses specifically on internet-based firms that allow rent appropriation from temporary utilization of underutilized assets. By looking at these firms' main characteristics and the current dynamics revolving around their internationalization process, the authors develop a framework to guide future research drawing from a business ecosystems perspective.
International Business	Chen, Shaheer, Yi & Li, 2018	Quantitative Sample: 24 apps from 8 subcategories (longitudinal cross-country database)	The study explores a user-network perspective and externalization logic, suggesting that businesses' internationalization process depends critically on users' collective interactions, instead of being solely driven by firms' market commitments, as noted by the Uppsala model.
International Entrepreneurship	Hänninen, Smedlund & Mitronen, 2018	Literature review, conceptual analysis and qualitative case study Sample: 4 multi-sided digital platforms (Alibaba Group, Amazon.com, eBay and Rakuten Group)	This paper explores how multi-sided digital platforms are transforming the retail exchange logic and assesses the implications and impact of these platform-based business on the retail sector, especially for business managers and consumers.
Management	Büyüközcan, & Göçer, 2018	Systematic Literature review based on academic literature, published books, industrial reports, Thesis, Websites, Conference Proceedings	This article reviews the state-of-the-art of existing Digital Supply Chain (DSC) literature

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Table 2 Prior literature on different fields regarding Digital Firms and their Internationalization (Continue)

Management	Köning, Ungerer, Baltes & Terzidis, 2018	Quantitative. Sample: 837 business plans collected between 2000 and 2016	This paper investigates evolution patterns of digital and non-digital business models. The objective of this paper is to compare patterns of business model evolution in digital and non-digital venture industries and to shed some empirical light on the usefulness of combining The Business model canvas (BMC) and the lean start-up manifesto (LSM) methods.
International Business	Ojala, Evers, & Rialp, 2018	Qualitative: longitudinal, exploratory single-case study	This article examines how Digital platform providers internationalize their services. The findings shed light on the relationship between technology and internationalization by demonstrating that the internationalization of digital platform providers is moderated by a variety of technical and strategic bottlenecks in the market.
International Business	Wittkop, Zulauf, & Wagner, 2018	Qualitative Case study Sample: 6 internet-based firms (B2B, B2C, C2B)	The purpose of this article is to develop a comprehensive understanding of how internet-based companies (IBC) internationalize in the digital market.
International marketing	Watson IV, Weaven, Perkins, Sardana, & Palmatier, 2018	Literature review, conceptual analysis	This article investigates the effect of Digital technologies and the changing global business environment to understand how relational approaches to international market entry (IME) are changing considering macro developments.
International Entrepreneurship	Autio, Nambisan, Thomas & Wrigh, 2018	Conceptual	This study explores the theoretical and conceptual underpinnings of the entrepreneurial ecosystem phenomenon and propose directions for further research. The authors compare the entrepreneurial ecosystem concept against theoretical constructs evoked in the economic geography, innovation, and management literatures.
International Entrepreneurship	Grochal-Brejdak & Szymura-Tyc, 2018	Qualitative, single case study (longitudinal. Sample: three e-commerce micro firm (from inception)	The study presents a holistic description of the internationalisation process of an entrepreneurial e-commerce firm. The simultaneous involvement in the inward and outward forms of internationalisation enhances the development of knowledge necessary for further internationalisation of e-commerce firms.

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Table 2 Prior literature on different fields regarding Digital Firms and their Internationalization (Continue)

International Entrepreneurship	Shaheer & Li, 2018	Quantitative. Sample: 127 Apps at Apple's store Health and Fitness in 50 countries	This paper analyses some salient factors affecting the internationalization speed of digital innovations by tracking international penetrations of 127 apps at Apple's app store. Although apps are globally available via online platforms, their international penetration is still subject to cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede app internationalization.
International Business	Vendrell-Herrero, Gomes, Collinson, Parry, & Bustinza, 2018	Quantitative Sample: a survey with 5,200 usable data points from consumers residing in fourteen geographically dispersed countries.	This article investigates, through the country-of-origin effect and value-in-use lenses, how the implementation of digital services creates opportunities for cultural industries to expand internationally. This study employs a unique consumer dataset with information on the internationalization of British cultural digital services.

3.2 Procedures for the thematic analysis

The procedures of data organization comprised the creation of an excel workbook to record and compare articles in chronological order. Each article was provided with a protocol number. Then, we content-analyzed each article to collect the following data: authors, title, year of publication, journal source, volume, issue, pages, and article type (review, conceptual, or empirical). In addition, in a following step, we extrapolated the aim of the study and findings. Based on this information, all articles (both conceptual and empirical) were labelled in the research trends analyzed above: digitalization, digital firms, and digital internationalization process. This classification was made inductively to facilitate the thematic analysis.

Inspired by the methodology adopted in previous reviews (Fisher and Reuber, 2011) we collected and codified some additional data to support the thematic analysis of empirical articles: (a) “digital” firm’s types analyzed, (b) methodological approach, (c) sample (number and characteristics of firms analyzed), (d) keywords, (e) key research findings, (g) industry, (h) country of research. Compared to previous works, some of these fields, like “sample size” and “venture types,” were recently introduced.

We developed a thematic analysis and synthesis in three steps: first, we carried out an initial

exploratory analysis aimed at pointing out some general features of the literature, the number of articles, article types, methodologies, country of research. In a following step, we conducted a thematic analysis of conceptual articles based on purpose, findings, and the outcomes of each article. Thereafter, through the data organized in the codebook, we carried out the thematic analysis of the empirical articles. The above-described steps are presented in Figure 1.

Given the numerous operational definitions existing in the literature (Coviello et al., 2017; Mahnke and Venzin, 2003, UNCTAD, 2017) and the variety of sampled firms, we choose to analyze the characteristics of firms analyzed in each article, in order to identify the papers that researched born digital firms specifically and separate them from the rest of the articles, which, instead, had a different prevailing focus. Driven by the goal of creating mutually exclusive categories, we established a criterion on which we based the categorization of works: the characteristics of sampled firms and theories adopted in each work.

As a result, through a preliminary reading of the selected articles, we inductively identified two categories of articles regarding the type of digital business model: (1) studies on purely born digital firms, and (2) studies on mixed born digital firms (online born-commerce firms). As a further step, we analyzed the purpose and findings of each empirical study and we identified some thematic groups inside these two categories. Each article was categorized in one of these thematic groups.

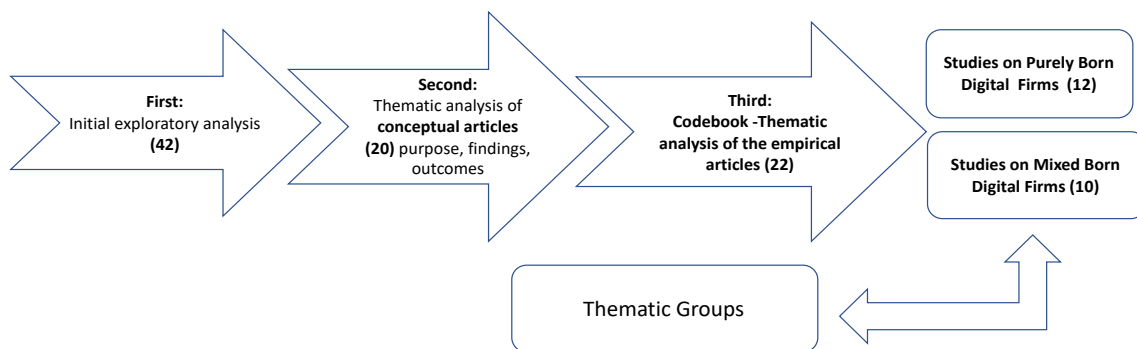


Figure 1. Procedures for the thematic analysis

4. Findings and Discussion

4.1 State of the art

This section offers figures on some descriptive elements of the sampled articles. The distribution of articles per year reveals that the topic is extremely young.

At first view, the analysis of articles immediately confirms the increased academic interest in born digital firms and their internationalization over the years, as illustrated in Figure 2. The number of articles ranges from 11 in ten years (from 2000 to 2010) to 12 articles in the last year (2018). The results indicate that the number of articles has increased especially since 2014, although the first article appears in the year 2001, in the period between 2000 and 2010 the publications are not constant in time and only eleven articles are published in ten years. In the last two years, we find 52% of articles published.

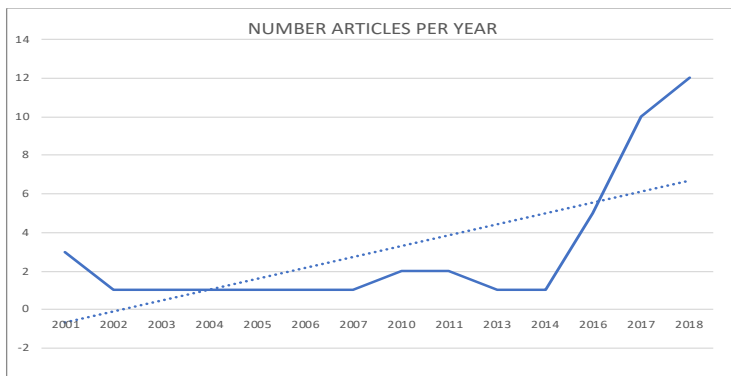


Figure 2. Number of articles per year

Most of the articles were published in the research field of International Business (19) and Entrepreneurship (11) which all together represent 71% of the literature here analyzed, as illustrated in Figure 3.

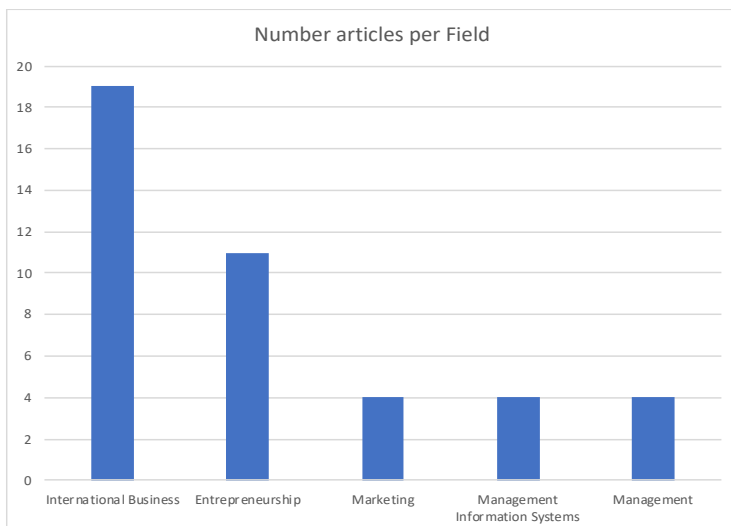


Figure 3. Number of articles per research field

As we mentioned above, the dataset of 42 articles is comprised of the 5 reviews, 15 conceptual studies, and 22 empirical studies, 13 qualitative and 9 quantitative studies. Comparing the type of articles published across the period analyzed, the conceptual studies raise from 2017 providing

theoretical and operational definitions around the concept of born digital firms and their internationalization. The empirical studies were 49% of the total articles analyzed, most of them published in 2018, as illustrated in Figure 4, possibly due to the novelty of the topic.

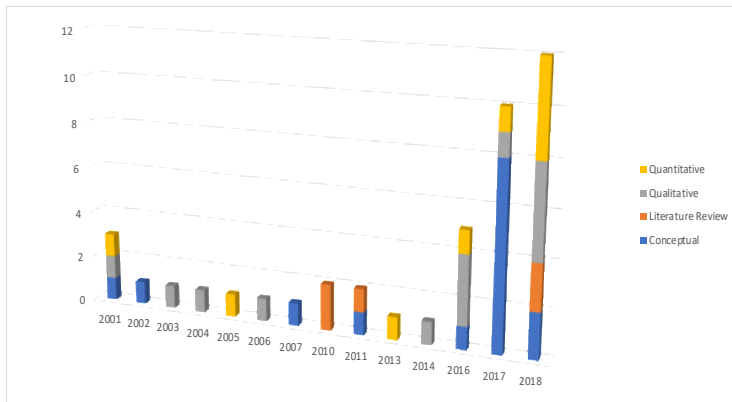


Figure 4. Typology of studies per year

4.2 Thematic analysis and discussion

We conducted a thematic analysis of conceptual articles based on purpose, findings, and the outcomes of each article (22 articles). Thereafter, we carried out the thematic analysis of the empirical articles. The empirical studies were categorized within two categories according to the characteristics of the firms analyzed and labels adopted, namely, (1) studies on purely born digital firms (12 articles), (2) studies on mixed born digital firms (e-commerce firms) (10 articles).

4.2.1 Conceptual articles, reviews, and theoretical models developed on born digital firms

The limited existing literature of International Business and Entrepreneurship on digitalization is highly fragmented across multiple streams of research. From the first decade of research, the conceptual studies and reviews were attempting to set up most salient International Business (IB) concepts and describing the probable range of impacts that digital ICT revolution might bring to bear on their fundamental assumptions (De la Torre and Moxon, 2001). Most of these studies addressed the internationalization process of new internet-based companies, in a broad sense, but not specifically to born digital firms, as we defined above.

One stream of research of International Business, which draws primarily on internalization theory, has analyzed the role of digital ICTs in coordinating and supporting the international activities of MNEs (Alcacer, Cantwell, and Piscitello, 2016; Coviello, Kano, and Liesch, 2017). This literature has emphasized what firm-specific factors are associated with the propensity of internet-based companies to enhance their international presence in Internet by developing country-specific websites (Kotha, Rindova and Rothaermel, 2001). Advances in digital ICTs may change the

relative attractiveness of different foreign operating modes, by improving communication channels, providing easier access to market information, and allowing for better remote monitoring of operations (De la Torre and Moxon, 2001). For digital firms, in particular, ICTs should greatly diminish the need for market-seeking FDI. As their digital products face minimal transportation costs and relatively few trade barriers when distributed over the internet, digital firms can serve foreign markets by exporting from their home country (Mahnke and Venzin, 2003; Nachum and Zaheer, 2005; UNCTAD, 2017). Accordingly, the extant literature has stressed the potential for born digital firms to enter foreign markets without establishing a physical presence abroad, and without physical products crossing borders, using what has been labelled “online,” “internet-based,” “virtual” or “remote electronic access” internationalization (Pezderka and Sinkovics, 2011; Yamin and Sinkovics, 2006; Strange and Zuchella 2017). Moreover, the findings of these studies are based on a wide range of industries, including manufacturing, which raises doubts about their applicability to digital firms. Finally, while these studies suggest a reduced need for market-seeking FDI, they have not addressed what types of digital ICT-based operating modes born digital firms might use to replace traditional FDI-based approaches.

The second stream of research is predominantly based on internationalization process theories and the impact of digital ICT conducting the international business. IB research on digital firms has mainly applied two broad types of internationalization process: the Uppsala model, as well as research more recently on INVs and born global firms as we mentioned above.

Most of the conceptual studies in this stream of research, have developed conceptual models or constructs on not purely born digital firms, named internet-related firms (Reuber and Fisher, 2011; Forsgren and Hagström, 2007; Onetti, Zuchella, Jones and McDougall-Covin, 2010), or new wave global firms (Bell and Loane, 2010). This research has often focused on a relatively narrow set of website-based businesses, such as “online portals”, which may not be representative of today’s digital firms (Reuber and Fischer, 2011). Conceptual models on purely born digital firms remain relatively scarce.

Several articles have reviewed the IB research field treating the sub-field of speed of internationalization and entry modes through digital technologies. Compared to traditional modes of foreign market entry, “virtual internationalization” greatly reduces the cost and risk of expanding internationally (Autio and Zander, 2016; Pezderka and Sinkovics, 2011; Knight and Liesch, 2016; Watson IV, Weaven, Perkins, Sardana, and Palmatier, 2018; Parente, Geleilate and Rong, 2018; Yonatan, 2017). As a result, the risk-mitigating incremental approach to internationalization may be less important, allowing digital firms to enter a large number of foreign markets early in their existence (Yamin and Sinkovics, 2006). Born digital firms also face pull-factors favouring rapid and extensive internationalization. The scalability and low marginal

costs associated with digital goods and services create a strong incentive to serve a larger market, to reap economies of scale (Forsgren and Hagstrom, 2007; Parente, Geleilate and Rong, 2018). Some studies argue that the behaviour of new types of firms like Internet-related firms might deviate considerably from what the Uppsala model predicts (Forsgren and Hagström, 2007). However, as we discuss below, several empirical studies propose that born digital firms are not immune to differences between countries in terms of cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede virtual internationalization (Shaheer and Li, 2018).

From a different perspective, several articles have reviewed the International Entrepreneurship (IE) research field (Amit and Han, 2017; Autio 2017), treating the subfield of Resource based View (RBV) and how digitalization of business allows entrepreneurs and managers alike to reimagine the boundary of their resource configurations and, thereby, enhance the value-creation potential of resources. Autio (2017) develops a Strategic Entrepreneurial International framework (SEI) that argues that INVs that adopt an active learning orientation, harness digital infrastructures for cross-border business model experimentation, encapsulate cross-border asymmetries in their activity system, and adopt a niche orientation are more likely to succeed in building sustainable competitive advantage.

In a similar vein, other works have focused on factors impacting on the likelihood of internationalization of new ventures, stressing the influence of entrepreneurs' digital capabilities (Nambisan, 2017; Etemad, 2017). Digital Entrepreneurship is generally referred to as the pursuit of opportunities based on the use of digital media and other information technologies (IT) (Reuber and Fisher, 2011).

Even though digital entrepreneurship can occur through the formation of a new firm or the transformation of an existing firm, studies have mostly focused on new firms. Moreover, digital entrepreneurship research recognizes that digital technologies affect individual entrepreneurs by reshaping their mentality (Di Domenico et al., 2014) and studies have been focusing on the new enabled conditions that lower the risk of entrepreneurial activities (Kelestyn and Henfridsson 2014). With the advent of Internet and the emergence of online global markets, entrepreneurial activities of online actors, and online intermediaries, regardless of their initial motives, time and location, have impacted the path of international market developments in general and entrepreneurial internationalization (Etemad, 2017). For example, Reuber and Fisher (2011) proposed a conceptual framework in which on-line technological capabilities are a resource related to a firm's successful pursuit of international opportunities. At the individual level of analysis, this resource may be complemented with the use of social media by founders and the online human branding of founders, to identify international opportunities and mitigate

uncertainties. Nambisan (2017) examines how the new digital technologies have transformed the nature of uncertainty inherent in entrepreneurial processes and outcomes. Digitalization creates social data (market networks) and intellectual data (market knowledge) about foreign markets earlier and faster than other methods, while also improving firms' attractiveness, decision processes, and capabilities of decision makers (Clark et al., 2018). Although decisions are often based on historical data or on experiences from other markets, a new market entry is a long-term investment in the future attractiveness of an untested foreign country (Neubert, 2017). This has raised important questions at the intersection of digital technologies and international entrepreneurship.

Digital technologies manifest in the realm of entrepreneurship in the form of three distinct but related elements—digital artifacts, digital platforms, and digital infrastructure (Nambisan, 2017). In this analysis, digital artifacts and digital platforms serve as part of the new venture idea (outcome) while digital infrastructure serves as an external enabler (supporting the process). The discussion of how the characteristics and other aspects of these digital technology elements affect the entrepreneurial process should be questioned, for example, why are some entrepreneurs (ventures) more successful than others in acquiring entrepreneurial resources through digital crowdsourcing and crowdfunding systems? How does the use of digital infrastructure (e.g., social media) by different entrepreneurs lead to different types of effectual cognitions and behaviours (and consequently different outcomes)? This research provides one important starting point addressing these questions, by examining the role of specific aspects of digital technologies in shaping international entrepreneurial opportunities, decisions, actions, and outcomes.

Drawing on Business Models theories, a new-born research stream has suggested new theoretical frameworks for born digital firms (Yonatany, 2017) and/or firms developing their business model around a new technological platform (Onetti, Zuchella, Jones, and McDougall-Covin, 2010). Strange and Zuchella (2017) provide an assessment of how the widespread adoption of new digital technologies (i.e., the IoT-Internet of Things, big data and analytics, robotic systems and additive manufacturing) may affect the location and organization of firm' activities within global value chain. Global Value Chain concept particularly is referring to adoption and impact of the new digital technologies (commonly known as Industry 4.0). The authors consider the implications of the technologies for IB theory and, in particular, for the nature of ownership, location and internalization advantages experienced by multinational enterprises (MNEs). Indeed, these articles have stimulated new reflections on the mechanisms and factors that drive born digital firms to engage and enhance their innovations outcomes and processes in the digital world.

In conclusion, there are few conceptual articles based on purely born digital firms. Most of these works enhance the IB research and underline its borders by merging concepts from new digital

technologies (Strange and Zuchella, 2017; Watson IV, Weaven, Perkins, Sardana, and Palmatier, 2018), providing a taxonomy of digital international market entry strategies. Other works have made impressive efforts to advance in the sub-field of internationalization speed (Forsgren and Hagström, 2007). Others conceptual studies have extended the IB research borrowing concepts from other domains (e.g., management information systems, marketing,) and integrating different theories (Autio, 2017, Etemad, 2017; Reuber and Fisher, 2001). Table 3 summarizes the themes examined in the conceptual articles.

<i>Conceptual papers advancing theory on born digital firms and their internationalization</i>
<p>Themes</p> <p>International Business Theories</p> <p>Internalization : Singh & Kundu (2001) ; Coviello, Kano, & Liesch (2017); Alcácer, Cantwell, & Piscitello (2016); Bell & Loane (2010)</p> <p>Speed and Entry modes: Uppsala theories vs Born Global/INVs</p> <p style="padding-left: 20px;">Purely digital firms : De la Torre & Moxon (2001); Yonatany (2017) ; Parente, Geleilate, & Rong (2018)</p> <p style="padding-left: 20px;">Others (internet related firms): Forsgren & Hagström (2007); Pezderka & Sinkovics (2011)</p> <p style="padding-left: 20px;">Watson IV, Weaven, Perkins, Sardana, & Palmatier (2018)</p> <p>Networks/ Models on Social Media Networks: Reuber & Fischer (2011); Alcácer, Cantwell, & Piscitello (2016)</p> <p>Resource Base View: Amit & Han (2017); Autio (2017)</p> <p>Entrepreneurship Research</p> <p>Digital Entrepreneurship: Nambisan (2017); Etemad (2017); Autio, Nambisan, Thomas & Wrigh (2018)</p> <p>Busines Models Theories</p> <p>Digital Business Models: Onetti, Zuchella, Jones, & McDougall-Covin (2010)</p> <p>Digital Suply Chain: Büyüközcan & Göçer (2018)</p> <p>Global Value Chain: Strange & Zuchella (2017); Nambisan, Lytinen, Majchrzak, & Song (2017)</p>

Table 3. Conceptual papers advancing theory on Born Digital Firms

4.2.2 Thematic analysis of empirical articles on purely born digital firms and their internationalization

A better explanation of similarities and differences among Purely Born Digital Firms

This category includes studies focused on purely born digital firms, referring to all the companies that internationalize through digital ICTs from inception and whose products and services are digital (Mahnke and Venzin, 2003). The empirical studies are illustrated in Table 4.

Empirical studies on purely born digital firms and their internationalization

Themes

Factors influencing speed, geography: Kotha, Rindova & Rothaermel (2001); Wentrup (2016); Shaheer & Li (2018); Vendrell-Herrero, Gomes, Collinson, Parry, & Bustinza (2018)

Factors influencing entry modes: Mahnke&Venzin (2003); Brouthers, Geisser, & Rothlauf (2016)

Network Theories, Social Media and Diffussion of Innovation: Fischer & Reuber (2014); Brouthers, Geisser, & Rothlauf (2016); Chen, Shaheer, Yi, & Li (2018); Ojala, Evers, & Rialp (2018)

Digital Business Models/ Value Creation: Hazarbassanova (2016); Köning, Ungerer, Baltes, & Terzidis (2018); Wittkop, Zulauf, & Wagner (2018)

Table 4. Empirical studies on “purely born digital firms and their internationalization”

Hence, we focus on ibusiness firms as a special type of e-business companies that use the Internet and other Computer Based Information Systems (CBIS) technologies to provide an Internet-based platform, which allows users to interact with each other (Brouthers, Geisser, and Rothlauf, 2016). These firms provide a platform that allows users to buy and sell products/services (marketplaces transaction brokers) to each other or exchange information (virtual communities) with each other. iBusiness firms generate value by providing the platform and organizing the input of users as well as manage the cross-relationships of the various users. Representative examples of ibusiness firms include social network sites like facebook.com or linkedin.com, which offer a platform for private as well as corporate users to communicate and interact with each other; job websites like monster.com or indeed.com, which allow job seekers and hiring companies to interact with each other; travel sites like hotel.com or tripadvisor.com, which match user demand with the offers of travel service providers.

Other studies (Ojala, Evers, and Rialp, 2018), focus on a new and increasingly important group of firms, namely digital platform providers, refers to digital-based INVs developing digital platforms. Digital platforms can be defined as “a shared, common set of services and architecture that serves to host complementary offerings” (Nambisan, 2017, p. 1032). By using services offered by firms developing and marketing digital platforms, it can listen to music as a service through Spotify or iTunes, watch movies through Netflix, or rent a house in a foreign country through Airbnb. This study posit that the internationalization process of digital platform providers represents a particular case of internationalization.

In a similar vein, Hazarbassanova (2016) proposes that “pure play digital service firms” differ in what their motivation to internationalise, how they deal with their liability of foreignness and how they learn to internationalise. The differences are consistent with the specificities of their value

creation. In this study, Internet firm is defined as a “for-profit organization, which conducts its business exclusively through an Internet-based platform, in a way that if the central servers of the firm are turned-off, the business of company will be interrupted” (Hazarbassanova, 2016, pg. 350). From this, it follows that the core product of the firm must be digital, consisting only of data distributable over digital channels. Based on this definition, we also include in this category empirical studies of firms that offer digital products, termed as digital innovations, which become instantly available across the globe via online platforms. (e.g., mobile apps and online software) (Shaheer and Li, 2018; Chen, Shaheer, Yi, and Li, 2018). This selection is also based on the ibusiness definition provided by Brouthers et al., (2016).

Hence, integrating products characteristics of digital products and services is an important variable in the explanation of internationalization patterns for born digital firms.

Speed and Sequence of Internationalization Process by Purely Born Digital Firms

There is little empirical evidence on whether purely born digital firms internationalize faster or slower than manufacturing firms. Some studies suggest that this category of companies is internationalized soon after their outset, which means that the speed of time to first entry is fast (Wentrup, 2016). This behaviour is supported by the born global theory internationalization (Oviatt and McDougall, 2005), and other studies on digital-based international new ventures (Ojala, Evers, and Rialp, 2018), that extend the scope of INV theories where firms internationalize proactively and rapidly after inception.

A driver behind the swift international expansion among born digital firms is the rapid speed and competition in the sector. It is generally stressed, and there is an underlying assumption in the industry, that first-mover advantage is crucial. Chen, Shaheer, Yi, and Li (2018) refer to this as the phenomenon of “winner takes it all”. The online industry is characterized by a pattern in which leading firms capture a disproportionate share of the market during a short time span via network effects, and this puts pressure on competing firms to engage in rapid internationalization. Additionally, in the case of digital start-ups, Shaheer and Li (2018) argue entry barriers may not impede offering its digital innovations. These firms can join globally accessible online platforms that internalize many barriers to internationalization, such as the presence into foreign markets, payment mechanisms, and trust between businesses and users (Autio et al., 2018; Nambisan et al., 2017). Affiliation with such platforms grants digital innovations global accessibility from inception with little or no barriers to entering foreign markets.

This is also evident in terms of “sequencing” or, in other words, the pace of subsequent market entries: the firms keep a high pace going in the early phase of internationalization. Online consumer mobility means that companies are pushed to act fast to attain a critical mass of

customers and manage the competition, leading to compressed sequencing (Brouthers, Geisser, and Rothlauf, 2015). This is in line with the theory of the internationalization of other type of Internet firms (Yamin and Sinkovics 2006; Sinkovics et al., 2013) that we discuss below.

However, empirical research has shed light into some critical factors that affecting the rapid pace of internationalization. In this sense, Wentrup (2016) emphasizes the balance in the internationalization process between an online and offline presence (“online-offline interval”). There seems to be a limit on how long a born digital firm can operate fully online without needing a physical presence. This study reveals the importance of home markets as a springboard, and of regional expansion in the early phase of internationalization. In addition, low entry barriers for online entry must be considered in relation to barriers in the offline context (e.g., legal compliance and market-specific requirements). In the case of digital platform, other studies indicate that the early internationalization and subsequent foreign market entries are governed by layered modular architecture, (Ojala, Evers, and Rialp, 2018), and its dependent on the platform provider’s capability to replicate a workable architecture stack in a target country. Therefore, main barriers faced by platform companies in their internationalization endeavours are the weaknesses of local technological infrastructure, the lack of complementary asset providers, and local regulations (Parente et al., 2018).

Regarding digital firms producing digital innovations, there are some salient factors affecting the internationalization speed. Although these category of born digital firms are globally available via online platforms, their international penetration is still subject to cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede firm’s internationalization. These companies may overcome these barriers by employing the demand-side strategies of engaging users in value co-creation (Shaheer and Li, 2018). In this sense, the CAGE distances in cyberspace may act as “user adoption barriers”, instead of market entry barriers.

Explaining Entry Modes by Purely Born Digital Firms

As we mentioned above, integrating products characteristics of digital products and services is an important variable in the explanation of the entry modes of internationalization patterns for born digital firms. Purely born digital firms seek to enter foreign markets through entry modes that allow control in branding and advertising strategies, because of the “experience character of digital goods” (Mahnke and Venzin, 2003). Thus, entry modes may be chosen to seek control regarding possibilities of customer education rather than overcoming the hazards of liabilities of foreignness, consider as a bilateral factor. In a similar vein, Wentrup (2016) argues that born digital firms prefer to enter international markets via controlled modes (e.g., subsidiaries). This is due to a network effect as well as the nature of online service itself, with a technical complexity.

However, some born digital firms are more likely to assume that online interactions generate insights not only on buyer behaviour and preferences, but also about the underlying market conditions that shape customer preferences and behaviour. The possibility of a “virtuality trap” is stronger in the case of digitalised products compare to non-digitalised products (Yamin and Sinkovics, 2006). By virtuality trap, these authors mean a perception by the internationalising firms that the learning generated through virtual interactions obviates the need for learning about the target market. Thus, digital internationalization is likely to engender a perception of reduced psychic distance.

Since the core offerings of born digital firms are “fully digital” (providing a platform for connecting users), and are transferred over electronic networks, they are instantly accessible from anywhere in the world (Brouthers, Geisser, and Rothlauf, 2016). Due to the cost of transferring from one country to another are relatively small, born digital firms will be influenced to a lesser extent by investment risks related to Liabilities of Foreignness (LoF) (Johanson and Vahlne, 2009). In contrast, digital firms should deal with greater Liabilities of Outsidership (LoO), since the main concern is the creation of a large enough network of users to generate value on its platform and create thick ecosystems in new countries (Brouthers et al., 2016). Such research would also require a clearer understanding of related factors such as the role of networks and ecosystems, as discussed below.

The Social Network theories and Diffusion of Innovation by Purely Born Digital Firms

Recent empirical studies (Kotha et al., 2001; Brouthers, et al., 2016; Chen et al., 2018; Fisher and Reuber, 2014; Vendrell-Herrero et al., 2018) analyze how user networks may affect digital firms’ internationalization about country penetrations and how these firms explore the way in which they may build competitive advantages. These studies focus on social network theories and diffusion of innovation theories perspective to analyse how born digital firms may be focus on learning to overcome issues of user-network outsidership by using its existing social network and diffusion of innovation as mechanisms to persuade potential users to adopt the firm’s platform in the foreign market.

As we mentioned above, digital firms should deal with greater Liabilities of Outsidership (LoO), because of the lack of embeddedness in the foreign market community. Liabilities of Outsidership, in general, refer to the fact that the internationalization process of a firm is conditioned by its acceptance into segmented business networks (Johanson and Vahlne, 2009). This is because this theory conceptualizes internationalization as a prolonged process of knowledge development. In the context of born digital firms, a fundamental characteristic is that these firms do not fully control what users or third-parties do or build on their platforms, but

instead generate value through maintaining and channelling the exchanges between various participants. The main concern is the creation of a large enough network of users to generate value on its platform. Hence, the success of a born digital firm lies in its ability to encourage mass-market adoption and build a large user network as well as diffusion of the novelty of its offerings (Brouthers, Geisser and Rothlauf, 2016; Chen, Shaheer, Yi, and Li, 2018).

Communication channels are an important element of diffusion on innovation (Fisher and Reuber, 2014) to reduce uncertainty and enhance differentiation. The role of opinion leadership in product diffusion has been long recognized (Iyengar, Van den Bulte, and Valente, 2011). In online social networks, individuals with a larger number of social ties have greater impact on the overall speed and number of adoptions. Drawing upon the notion of country clout, Chen et al., (2018) extend this literature to the user-network level and focus on diffusion across countries. The widespread adoptions in high-clout countries enhance the substantive network benefits that potential adopters in other countries can derive from joining a new network. In a similar vein, other studies (Vendrell-Herrero, Gomes, Collinson, Parry and Bustinza, 2018) evaluate the country of origin, cultural distance, exoticness, brand image, and flag-brand, and how these factors influence positively the purchasing decision of consumers that are hesitant when making a purchase of culturally-based digital services (e.g., music (Apple Music, Spotify), or movies (Netflix)).

This line of research may represent an avenue for future inquiries. In this way, for instance, future research could clarify how these firms deal with their LoF and LoO and the specificities of their value creation, identifying internationalization patterns has not yet been explored.

Impact of Business Models components on Purely Born Digital Firms

A recent emerging theme pertains to Business Models of born digital firms. Digital Firms have been considered innovative firms (Brouthers et al., 2016). The impacts of value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), the specific way of creating value and the individual customer interface used by a digital business play key roles in digital internationalization. On this theoretical basis provided, it is possible to develop a comprehensive understanding of how born digital companies are internationalizing and why their internationalization processes differ. Digitalization impacts on the business model as technologies enable new ways of value creation and customer relationships. Exemplary is the customer segmentation based on interest-based factors, which is enabled by the analysis of big data derived from social networks (Hänninen, Smedlund and Mitronen, 2018). Digital companies often do not conduct market research before starting their international expansion. The costs and the risk of failure have decreased due to digitalization so that the advantage of trying to enter the market is

considered superior compared with a long, costly, and incremental market entry (Autio and Zander, 2016). In this sense, the business model concept can help provide a structure to the large number of variables in the IB theories. A differentiation in the value proposition, value creation and delivery, and value capture is recommendable as a framework for a differentiation of internationalization strategies among different types of born digital firms (Witkop, Zulaf and Wagner, 2018). A differentiated analysis of digital firm's internationalization shows that born digital firms need to be considered as forming a heterogeneous group. Hazarbassanova (2016) proposes that the value creation process of born digital firms causes them to differ from each other, just as much as they differ from traditional firm. The relation of the value proposition to internationalization strategies has strong evidence but is not explained by IB or the IE theories. It has been confirmed that both the customer interface and the value creation logic are relevant variables. The value creation and delivery method is reflected in many of the traditional internationalization theories and remains crucial (Hazarbassanova, 2016). The value capture dimension (revenue model and financial aspects) is found to be less determining, as it itself is a determinant of the first two business model's components (Witkop, Zulaf and Wagner, 2018). Köningm Ungerer, Baltes, and Terzidis, (2018) analyse different patterns in the evolution of digital and non-digital ventures business models through the early stages of the business cycle. Digital ventures focus initially on developing transactions with their customers before searching investments in contrast with non-digital, that require investments beforehand to build capital-intensive assets for value creation.

Future research is needed for a deeper explanation of similarities and differences on business models of Born Digital Firms. That is crucial for a better understanding of strategic and operational implications and its internationalization process.

4.2.3 Thematic analysis of empirical articles on mixed born digital firms (e-commerce)

Types of e-commerce firms

This group of studies includes only full online and online-born commerce companies that internationalized shortly after their foundation. In our review, the studies related to e-commerce channel of traditional business and multichannel retailer are excluded of this category. The empirical studies are illustrated in Table 5.

Empirical studies on mixed born digital firms

Themes

Factors (micro and macro) influencing active online internationalization (speed, foreign market selection): Yamin & Sinkovics (2006); Sinkovics, Sinkovics, & Jean (2013); Schu, Morschett & Swoboda (2016); Schu & Morschett (2018); Luo, Zhao, & Du (2005)

Value creation: Amit & Zott (2001)

Leverage inward-outward capabilities/Network Theories: Loane, McNaughton, & Bell (2004); Grochal-Brejdak & Szymura-Tyc (2018)

Digital Business Models e-commerce platforms: Hänninen, Smedlund, & Mitronen (2018); Li, Shu, Zhang, & Mao

Digital Entrepreneurship: Li, Shu, Zhang, & Mao (2017)

Table 5. Empirical studies on “mixed born digital firms”

There are few studies in which the issue of “virtual internationalization” is analysed (Grochal-Brejdak and Szymura-Tyc, 2018) regarding to online-born commerce companies. Most of them are mainly about the traditional firms which have started a direct sale through internet, complementing the prior sale executed by foreign intermediaries (Anderson, 2005; Sinkovics, Sinkovics, and Jean, 2013). Furthermore, the studies on mix born digital firms include a wide group of firms which are, in general, defined as enterprises engaged in electronic commerce from inception (Singh and Kundu, 2002), and with essential turnover derived from online transactions (Luo, Zhao and Du, 2005). E-commerce firms are highly differentiated by their main activity (trading, service and production firms), type of products offered (digital or tangible goods and services) to diverse customers, representing various e-business models (e-stores, international intermediary platforms (Alibaba, Amazon, Rakuten, eBay, etc.), having a different size, managed by the owner (entrepreneurial or family firms) or by professional managers. The e-commerce platforms (business-to-business, business to consumer or consumer to consumer platforms) allow firms and users to interact and buy and sell products online (Li, Shu, Zhang, and Mao, 2017). These authors also present new insights into how digital platform service providers can help Small and Medium Enterprises (SMEs) transform and compete, for example, helping entrepreneurs engage in new social networks, pushing to create, e.g., Chambers of Net Commerce. As a digital platform, back-end data processing is powerful. It provides to SMEs allow them to understand their visitors and customers better.

Their common characteristics is taking advantage of the Internet-based information and communication technologies (ICT) to expand sales domestically and internationally.

The internationalization process, path, and strategy of mixed born digital firms

This category of studies, refers exclusively “active online internationalization” (AOI) (Yamin and Sinkovics, 2006; Harzabassanova, 2016; Sinkovics, Sinkovics and Jean, 2013), in contrast with “passive or default online” internationalization, that refers to firms with a domestic website, and which do not actively pursue or target foreign customers. In AOI, the internationalising firm

creates websites intended as vehicles for conducting online business in particular foreign countries. Given the inherent risks of e-commerce, particularly in the cross-border context, AOI is likely to target countries that have reached 'e-commerce readiness' (Luo, Zhao, and Du, 2005,) in terms of adequate electronic infrastructures, credible payment systems and supporting legal and institutional structures (macro-level factors). In contrast to 'default or passive' online internationalisation, AOI can be considered as a significant investment in 'entering' a particular country or regional market. As such, it has features similar to traditional foreign market entry and international expansion, such as the relevance of intangible and firm-specific assets, as has been argued by Kotha et al., (2001) and Singh and Kundu (2002). However, there are also significant differences between traditional market entry and AOI.

The fundamental difference between traditional market entry and AOI is that the latter does not necessarily entail any level of foreign investment in assets or activities. In AOI, the distinction between pre- and post-entry is blurred. Cyber-transactions with customers are for the most part managed from home. Thus, relative to traditional internationalisation, online internationalisation is more likely to be under the direct control of top-level decision-makers who reside in the home country of the internationalising firm. It is, therefore, reasonable to conclude that compared to traditional internationalisation, AOI is a much more 'home'-centred phenomenon (Yamin and Sinkovics, 2006).

Regarding the sequencing of foreign market entry, AOI is likely to be much more time-'compressed' compared to traditional internationalisation. A consequence of near-simultaneous entry into several markets may be to reduce the extent of deliberate knowledge acquisition about markets to be entered. The two distinctive features, namely 'market isolation' and 'dilution of sequencing' (Yamin and Sinkovics, 2006) indicate that the online internationalisation is somewhat disengaged or disconnected from the business and institutional environment in the foreign market which it is entering, certainly compared to traditional market entry situations. These authors also propose that online internationalisation may induce a general reduction of psychic distance because of the experience of online interactivity is likely to generate insights on customer preferences and behaviour. However, the results of their empirical study demonstrate that facilitating effects of online internationalisation would not fully substitute for cultural and business learning associated with physical presence in foreign markets (e. g., via export agent or an export office), and reduces the possibility of a 'virtuality trap'.

Like other Internet-based firms, the born-online commerce firms internationalise their activity easier and faster than traditional firms (Forsgren & Hagström, 2007), but their internationalisation paths might differ depending on various factors (Luo, Zhao, and Du, 2005; Yamin and Sinkovics, 2006; Sinkovics, Sinkovics, and Jean, 2013; Schu, Morschett and Swoboda, 2016; Schu and

Morschett, 2017; Grochal-Brejda and Szymura-Tyc, 2018). Luo et al., (2005) analyse both micro-level (firm) and macro-level (host-country) factors affecting the speed of international expansion of born e-commerce companies, concluding that the speedy foreign market entry by e-commerce firms was positively influenced by top management team's international experience, innovative and marketing capabilities. Depending on the digital or non-digital nature of the product/service, Yamin and Sinkovics (2006) proposes differences in two distinct value chain contexts. In this sense, in the case of digital goods, the totality of the cross-border value-chain can be created online (e.g., software, music or online banking financial services) (Kotha, Rindova and Rothaermel, 2001; Mahnke and Venzin, 2003). When products and services are not digitalised (manufactured products), online internationalization refers only to those aspects of the value-chain that are conducted online (e.g., the sales and some after sales service and support). Regarding born online retailers of physical goods, Schu, Morschett and Swoboda (2016) highlight the imitability of an online shop as the most important factor influencing the internationalization speed. In the same context of firms, Schu and Morschett (2017) analyse the factors influencing the foreign market selection. The results indicate that market size, rule of law, and local market knowledge, as well as a common language and the logistics performance of a target country have a positive effect on the likelihood of selecting a target country. Although the Internet is said to reduce the impact of distance, both cultural and geographic distance as well as added geographic distance still show a negative impact on the selection of foreign markets by online retailer. From the analysis of multi-sided digital platforms (e-commerce) and the impact on the retail sector, Hänninen et al., (2018) suggest that platform-based business models 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 just maximizing the sales margin

Since the research of mixed digital firms as a born-digital commerce firms remain scarce, future research could investigate how entry speed is jointly interacted with other entry decisions, and how such interactions impact overall evolutions of born e-commerce firms internationalization and overall consequences of foreign investments.

5. Trends and future research directions

The paper's goals were to conduct a systematic review to develop a more complete understanding of how the emergence of born digital firms presents a distinct phenomenon of an internationalizing enterprise, and to explore opportunities for future studies about firms' internationalization process from different lens. Our review of 42 studies demonstrates that there is no consensus on the definition of digital firms and their internationalization processes. Based on this systematic analysis, we develop suggestions for future research presented in Figure 5.

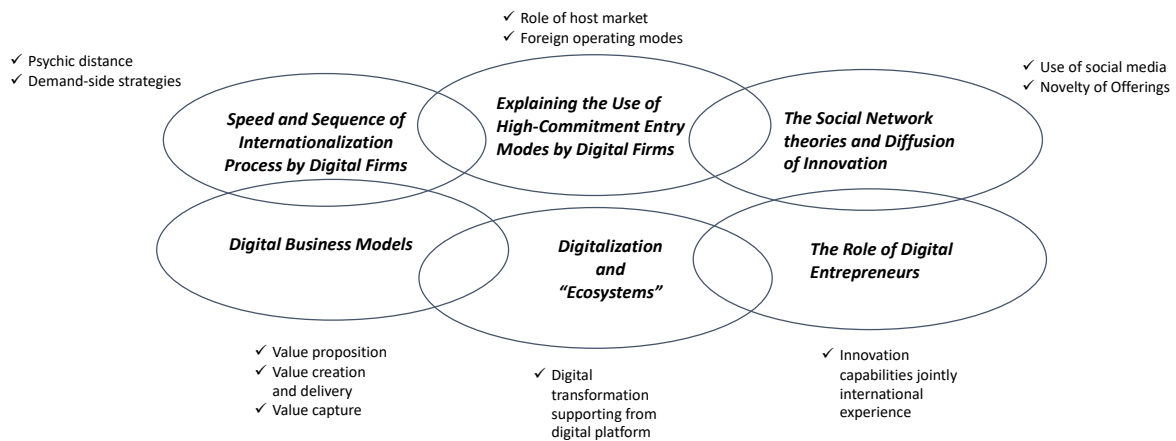


Figure 5. Future Research Directions

Speed and Sequence of Internationalization Process by Born Digital Firms

Some studies suggest that online internationalization entails a more compressed version of the traditional internationalization process, in which the required resources commitment is reduced by the benefit of the Internet, while the specific market knowledge is obtained by learning-by-exporting. As a result, a faster internationalization process is observed among born digital firms, while the underlying mechanisms of market learning and network strategies may still apply. Moreover, such compressed internationalization processes may still also feature a dependence on various factors as suggested in Reuber and Fischer (2011) study of internationalization based on online reputation, online technological capabilities and online brand communities. More research into the precise nature of the psychic and other factors involved and how these affect online internationalization will be valuable. Furthermore, future research may focus on demand-side strategies based on social sharing and virtual community strategies to reevaluate the drivers behind the internationalization speed of born digital firms.

Explaining the Use of High-Commitment Entry Modes by Born Digital Firms

Extant literature has stressed the potential for born digital firms to enter foreign markets without establishing a physical presence abroad, and without physical products crossing borders, using what has been labelled "online," "internet-based," "virtual" or "remote electronic access" internationalization (Pezderka and Sinkovics, 2011; Yamin and Sinkovics, 2006; Strange and Zuchella, 2017). However, other factors such as customer norms and habits could also create distances in the digital context. For instance, host country specific customers' online purchasing behaviors such as pricing (Luo et al, 2005) could possibly disadvantage foreign firms lacking

sufficient market or cultural knowledge to acknowledge such behaviours in the host market. Thus, it is suggested that these liabilities or distances do not fade in the digital context, instead, they could even be exacerbated when they are also constrained by liability of smallness and newness. Such local market specific features also highlight the need to gain local market knowledge, which in turn will possibly require a local presence as such market knowledge may not be fully available online. Hence, more research is needed to understand the role of host market presence and resource commitment by digital firms. Additionally, further research should investigate different foreign operating modes used by born digital firms and their potential variation among their internationalization patterns, integrating product/service characteristics.

The Social Network theories and Diffusion of Innovation

Another interesting avenue for future research is to link born digital firms up to the use of social media (possibly also linking up to the notion of “ecosystems” as discussed below). Social media is an emerging topic in international marketing (Reuber and Fischer, 2014) and there seem to be crucial but largely unexplored regarding to purely and mixed born digital firms. Digital internationalization process depends critically on users’ collective interactions, and their success lie in their ability to encourage mass-market adoption and build a large user network (Chen et al., 2018). Recent research proposes that the internationalization of born digital firms is conditioned by liabilities of user-network outsidership (Brouthers et al., 2016), yet the source of such liabilities has not been fully explored.

Future studies could focus on internationalization strategies of social media firms (e.g., Twitter, Instagram, etc.), social-media based branding strategies of global brands, use of social media as a vehicle for rapid internationalization, especially in culturally-based digital services. Future research could make investigate, also, the novelty of the firms’ offerings based on efficiency, complementarities and lock-in effects (Amit and Zott, 2001).

The Role of Digital Entrepreneurs

The discussion of how the characteristics of digital technology elements affect the entrepreneurial process should be questioned, for example, why are some entrepreneurs (ventures) more successful than others in acquiring entrepreneurial resources through digital crowdsourcing and crowdfunding systems? How does the use of digital infrastructure (e.g., social media) by different entrepreneurs lead to different types of effectual cognitions and behaviours (and consequently different outcomes)? This research provides one important starting point addressing these questions, by examining the role of specific aspects of digital technologies in shaping

international entrepreneurial opportunities, decisions, actions, and outcomes. Future studies may to investigate the effect of entrepreneurs' international experience jointly with their innovation capability and market orientation on the internationalization of born digital firms.

Digitalization and "Ecosystems"

One important point raised by the literature on digital platforms is the potential importance of "ecosystems". The idea of business ecosystem highlights that there is an opportunity space that cannot be explored by individual firms but that requires multiple partners, collective action, alignment, and convergence of vision towards an overarching value proposition (Li et al., 2018). These dimensions seem interestingly important for value co-creation in the context of increased internationalization within digital economies. Future research could analyse how entrepreneurs with inadequate digital capabilities and limited resources could drive their digital transformation to cross-border e-commerce supporting from digital platform service providers.

Digital Business Models

A differentiated analysis of digital firm's internationalization shows that born digital firms need to be considered as forming a heterogeneous group. Hazarbassanova (2016) proposes that the value creation process of born digital firms causes them to differ from each other, just as much as they differ from traditional firm. Using the value creation logic framework (e.g., value network, value shop and value chain) its potential to identify internationalization patterns has not yet been explored.

The IB theory has focused on variables such as efficiencies of the value chain, internal capabilities, and resource endowments. Some studies show that these theories still have high impacts on the internationalization strategies of born digital firms (Wittkopp et al., 2018). A differentiation in the value proposition, value creation and delivery, and value capture is recommendable as a framework for a differentiation of internationalization strategies among different types of born digital firms.

Further research needs to investigate other variables to be considered in the highly dynamic digital markets. In addition to the impacts of value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), the specific way of creating value and the individual customer interface used by a digital business play key roles in digital internationalization.

6. Conclusions, limitations, and implications

This systematic review has investigated the important current issue of the emergence of international born digital firms regarding to the substantial literature on digital internationalization in International Business and Entrepreneurship spanning the last two decades. It is quite evident that the extant literature on the internationalization of digital firms is quite fragmented and disperse. However, although the literature on international born digital firms is still relatively small, it has been confirmed that digital firms are a very relevant context for rapid internationalization and tend to be INVs or born-global firms. However, the review has also demonstrated that traditional IB concerns highlighted by the Uppsala internationalization model such as the need for local market knowledge and the potential impact of cultural and institutional distance, and the Liabilities of Foreignness and Outsidership, remain valid in the digital context. Although born digital firms tend to internationalize more rapidly, there is also evidence that they are following a “compressed” sequential internationalization process whereby factors such as psychic distance still play an important role, and it may carry out to born digital firms making high resource commitments to host markets. Therefore, the present literature review has demonstrated that many issues related to born digital firms and their internationalization remain understudied yet.

This study, however, has also several limitations. Firstly, the selection of studies focused on the concept of digital firm may not be free of possible omissions given lack of clarity in the adoption of definitions of digital enterprise in the current literature. For this reason, the exclusion criteria used may seem subjective when trying to categorize the articles. Moreover, we acknowledge the limitations that stem from the exclusion of some sources (e.g., books, book chapters, and other journals) and from the choice of the keywords. The second limitation concerns the identification of categories and themes. Many of the studies refer to the digital enterprise as those that base their business model on digital technologies such as those that, although not strictly digital, use the Internet as a sales channel to internationalise. The two categories used are based both on the business model provided by Brouthers et. al., (2016), as well as in the definition of the digital product/service according to Mahnke and Venzin (2003). It could be interpreted by researchers that there are more categories, such as high-tech companies, knowledge intensive firms, or lean global start-ups (Neubert, 2018), as categories to be included. For example, in the case of studies on global start-ups, in which they are defined as a new international venture that create a new market niche using innovative technology and a new business model (Tanev, 2017), some doubts were raised. Although we selected articles related to these types of companies in the first selection of the 146 studies, we finally decided to exclude them because many articles published during the period 2000–2018 did not specify the samples’ characteristics or did not properly adopt the digital firms labels in accordance with the firms’ features. Thus, we excluded all those articles in which

the products/services of the sample were not digital, or because their business model was not included on the two categories provided by Brouthers et. al., (2016).

While primarily a guide for research, this review may also function as a practical guide for managers who seek to internationalize their digital new ventures. We shed light on the highlighted factors and strategies that drive active online internationalization and determine better international performance during the pre-entry and entry phases. Moreover, a branch of studies has highlighted how born digital firms may develop demand-side strategies based on social sharing and virtual community strategies to reevaluate the drivers behind their internationalization speed. Another important aspect concerns the benefits that born e-commerce companies may derive from their relationships with digital platforms, which may become fundamental in developing successful strategies in the international landscape.

Last, our study has confirmed the existence of born digital firms and rapid internationalization suggesting that this phenomenon remains an object of interest, which offers insights on how new and young digital ventures internationalize, but also on the failures and risks (e.g., virtuality trap), that these companies encounter during their evolution.

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CHAPTER 3

Recognizing International Opportunities by Born-digital Entrepreneurs: A Qualitative Approach

Abstract

This article conducts an in-depth investigation of International Opportunity Recognition in a Born Digital Start-up based on how entrepreneurs' decisions drive the new firm's internationalization behaviour and explores the role of digital capabilities possessed by the entrepreneurs. Accordingly, the aim of this research is to enhance our understanding of entrepreneur's digital capabilities and their decision-making logic regarding internationalization within a Born Digital Start-up using effectuation as a theoretical approach.

A qualitative and interpretive method is used for this purpose in a single case setting. The primary data collection method was in-depth interviews conducted with two of the founders of the case company and two members of their management team. Moreover, an inductive analysis was applied. In doing so, this study offers novel and significant perspectives for the fields of Digital and International Entrepreneurship, as well as from the lens of effectuation theory.

Keywords: *Digital Entrepreneurship, Born Digital firms, Effectuation, International Opportunity Recognition*

1. Introduction

The International Entrepreneurship (IE) literature (McDougall and Oviatt, 2000) posits that early and accelerated internationalization of new ventures is associated with strong organizational capabilities such as innovation, market orientation, and international marketing skills (Cavusgil and Knight, 2015; Aspelund et al., 2007). Oviatt and McDougall (2005) coined the following definition of the field:

“International Entrepreneurship is the discovery, enactment, evaluation and exploitation of opportunities – across national borders – to create goods and services “(Oviatt and McDougall, 2005, p. 540).

More recently International Entrepreneurship (IE) research field has moved on from its early emphasis on international new ventures and their early internationalization process towards studying international entrepreneurial behaviours (Mainela, Puhakka, and Servais, 2014) at different levels i.e., organizations, groups and individuals, and the concept of opportunity has been referenced as a core construct to develop further IE research (Chandra et al., 2012; Dimitratos and Jones, 2005; Etemad, 2015; Jones et al., 2011; Mathews and Zander, 2007). These studies consider that opportunity is not only present in the environment waiting to be discovered, but it can also be created by the entrepreneur.

Entrepreneurs’ capabilities to discover and create opportunities and their decision-making processes are argued as being central to understanding the firm’s international growth (Mainela et al., 2014; Anderson and Evers, 2015). Nonetheless, extant IE literature has yet to systematically analyse how specific entrepreneur’s capabilities are developed in a way to enable international opportunity recognition of an increased number of emerging companies that derive all of their revenue from virtual marketplaces and offer only digital products —these are referred to here as born digital companies (Monaghan et al., 2020). Most of the rather scarce studies on born digital firms’ internationalization are based on digital capabilities at firm level (Brouthers et al., 2016; Coviello, Kano and Liesch, 2017; Cahen and Borini, 2020; Monaghan et al., 2020). In addition, it must be taken into account that the fact of being a born digital firm might create new forms of internationalization through digital sales, digital users, and digitally interconnected partnerships. This could imply the possibility of identifying entrepreneur’s developing digital capabilities that are different from non-digital firms. Digital technologies create more variability in entrepreneurial activities and allow entrepreneurs to rapidly and easily enhance their capabilities and performance to create value (Nambisan, 2017). In this context, the research stream of Digital Entrepreneurship has emerged as an intersection between digital technologies and entrepreneurship literature. Some scholars suggest that the capabilities required in undertaking the digital entrepreneurial process may also be different, because the digital entrepreneur faces increasingly dynamic paths, determined by diverse activities with uncertain time frames (Nambisan, 2017; Kraus et al., 2019; Hull et al., 2007). However, research is still scarce in identifying and understanding how the entrepreneurs’ digital capabilities are developed in a way to enable a new venture to explore and exploit international opportunities in a digital context (Glavas, Mathews and Bianchi, 2017; Zaheer, Breyer, Dumay and, Enjeti, 2018; Dillon et al., 2020). In this respect, this is one of the areas requiring further research in International and Digital Entrepreneurship fields.

In addition, following the research stream on effectuation (Sarasvathy, 2001, 2008), this research posits that digital entrepreneurs develop specific capabilities (Schweizer, Vahlne, and Johanson, 2010) at the stage of starting new businesses and/or acting under high uncertainty, that influence their decision making-logic to recognize international opportunities (Dew et al., 2009; Perry et al., 2012; Read et al., 2009; Sarasvathy, 2001). Effectuation provides an explanation of why individuals end up building new business activities even when that was not their initial goal when they started their operations. The entrepreneurs take risks merely to the extent to which they are prepared to take losses and retain the ability to adapt to changes brought on by the environment (Sarasvathy, 2001, 2008). Therefore, effectuation approach appears adequate to understand the process of decision making in an uncertain operating environment or in a situation in which the market does not yet exist, and it can be described as an essential aspect of entrepreneurial capability (Sarasvathy et al., 2014). However, little research has applied effectuation logic in a digital context so far (Baber et al., 2019; Ghezzi, 2018; Anagnou et al., 2019). IE research is scarce in understanding entrepreneurs' decision-making ability concerning international opportunity recognition in a digital start-up. Besides, these few studies are focused on firm level rather on individual level.

Accordingly, the aim of this research is to conduct an in-depth investigation of entrepreneurs' digital capabilities and their decision-making process to recognize international opportunities in the context of Born Digital Start-up. For this purpose, effectuation approach seems to be a suitable framework for fulfilling the objectives of this study.

Hence, based on these research gaps and future research suggestions from previous studies, the research questions for this article are as follows: How and why do entrepreneur's digital capabilities affect international opportunity recognition in a digital context? How is digital entrepreneurs' decision-making logic applied in order to recognize international opportunities in a Born Digital Firm?

The above-mentioned research questions are answered through a longitudinal study conducted using a qualitative and interpretive method in a single case setting. This approach emphasizes the individual interpretations and enables in-depth descriptions of the studied phenomenon (Walsham, 1995). An interpretive approach provides a deep insight into "the complex world of lived experience from the point of view of those who live it" (Schwandt, 1994, p. 118).

We contribute to and expand on existing International and Digital Entrepreneurship in terms of both theory and practice in several ways. First of all, we contribute to the digital entrepreneurial process by revealing how the entrepreneurs' digital capabilities are developed in a way to explore and exploit international opportunities in a digital context. Secondly, we contribute to effectuation

theory by examining entrepreneur's decision-making process to recognize international opportunities in a Born Digital Start-up. Finally, our study responds to calls of research for advancing the drivers on born-digital start-up internationalization at individual level (Coviello, Kano and Liesch, 2017; Monaghan, Tippmann and Coviello, 2020; Mainela, Puhakka and Servais, 2014; Glavas, Mathews and Bianchi, 2017; Cahen and Borini, 2020).

In the following sections, we first lay out and justify our conceptual approach of entrepreneurs' digital capabilities and their decision-making process at recognizing international opportunities using an effectuation theory approach. The subsequent section describes the research design followed by empirical findings and our propositions. Finally, we discuss the theoretical and practical implications of our findings and conclude with future research implications.

2. Literature and conceptual background

2.1 Internationalization of Born Digital Start-ups in International Entrepreneurship literature

International Entrepreneurship (IE) has emerged as an important area of investigation for researchers in both International Business and Entrepreneurship (McDougall and Oviatt, 2000; Oviatt and McDougall, 2005). Studies of born global firms (BGFs) (Knight and Cavusgil, 2004) and international new ventures (INVs) (Oviatt and McDougall, 1994) are deeply rooted with the IE field. The IE literature indicates that early and accelerated internationalization of new ventures is associated with strong organizational capabilities such as innovation, market orientation, and international marketing skills (Cavusgil and Knight, 2015; Aspelund et al., 2007). Many IE studies try to explain the power of such critical (dynamic) capabilities typically related to international market orientation, international marketing capabilities, and innovation capabilities (Knight and Cavusgil, 2004; Rialp and Rialp, 2007; Gassmann and Keupp, 2007; Knight and Kim, 2009). Empirical research has also analyzed the impact of those capabilities on a variety of new venture issues, including international performance (Knight and Kim, 2009), product innovation (Knight and Cavusgil, 2004), and speed of internationalization (Gassmann and Keupp, 2007). With the advent of the Internet, the IE studies have increasingly focused on any of two different perspectives: the first group considering the Internet as a tool (Gabrielsson and Gabrielsson, 2011; Kotha et al., 2001; Mahnke and Venzin, 2003; Singh and Kundu, 2002), in contrast with a second perspective that considers the Internet as a core competence (Loane et al., 2004; Chen et al., 2019; and Brouters et al., 2016). In our study, we focus on the second perspective, that is, we focus on the articulation of IE using the organizational and entrepreneur's

capabilities perspective to identify the specifics of companies that derive all of their revenue from virtual marketplaces and offer only digital products, referred here as born digital firms (BDFs).

As mentioned above, mainstream International Entrepreneurship literature lacks a deeper discussion on specific entrepreneur's digital capabilities that enable internationalization of born digital start-ups. Most of the rather scarce studies on born digital firms' internationalization are based on digital capabilities at firm level (Cahen and Borini, 2020; Monaghan, Tippmann and Coviello, 2020). For digital companies, the costs of transferring digital products over the Internet from one country to another are relatively small (Brouthers et al., 2016; Kotha et al., 2001; Loane et al., 2004). They reach users online and distribute their product in virtual marketplaces. The recent literature suggests that digital firms tend also to be international new ventures (INVs) and born global firms (BGFs) (Autio et al., 2017; Brouthers et al., 2016; Monaghan et al., 2020), because their products are "instantly accessible from anywhere in the world" (Brouthers et al., 2016, pg. 514). Some scholars have argued that born digital firms reduce the need for market-seeking foreign direct investment (FDI) (Eden, 2016; UNCTAD, 2017). Digital firms are thought to pursue primarily 'virtual' internationalization, i.e., without establishing a physical presence in foreign markets (Singh and Kundu, 2002; Yamin and Sinkovics, 2006). However, other studies indicate that digital firms may follow different patterns of internationalization as compared to INVs and BGFs, and do not necessarily serve foreign markets from inception, because of differences in terms of culture, languages, and consumer preferences, among others, may require modifications on digital products and services to suit local needs (Blum and Goldfarb, 2006, Shaheer and Li, 2018). Based on this, digital companies cannot usually activate in a market without being partly present offline, in general, because of legal compliance and market-specific requirements (e.g., a dependence on local e-commerce merchants) (Wentrup, 2016). Moreover, these firms should deal with greater liabilities of outsidership (LoO), since the main concern is the creation of a large enough network of users to generate value on its platform and create thick ecosystems in new countries (Brouthers et al., 2016). Nevertheless, the extant literature on the internationalization of born digital firms is quite fragmented and disperse. Besides, avenues of research are opened in relation digital entrepreneurs' capabilities and their international orientation for active online internationalization of their firms. Therefore, digital entrepreneurs could develop capabilities that are different from those of non-digital entrepreneurs.

2.2 International Opportunity Recognition by Born-Digital Start-ups

Recognition of market opportunities is a central part of the entrepreneurial process (Shane and Venkataraman, 2000). Entrepreneurship contains the "processes of discovery, evaluation, and exploitation of opportunities; the individuals who discover, evaluate, and exploit them and the examination of sources of opportunities" (Shane and Venkataraman, 2000, p. 218). However, not

only research on opportunities and their recognition is analysed in the disciplinary context of Entrepreneurship, it can be also found in the International Entrepreneurship literature (e.g., Chandra, Styles, and Wilkinson, 2009; Ellis, 2011; Nummela, et al., 2014; Kontinen and Ojala, 2011; Zahra, Korri, and Yu, 2005). Although existing theories of internationalization draw from the premise that internationalization starts with opportunity recognition, definitions of international opportunity (IO) and of international opportunity recognition (IOR) vary as scholars examine it from different theoretical approaches. According to the view of Chandra et al. (2009), several propositions maybe advanced concerning each of the three main drivers of the initial international opportunity recognition process identified in the literature, i.e., prior knowledge, international network structure, and a firm's entrepreneurial orientation (EO), at both firm and individual level. In their study, they incorporate both the discovery of and search for opportunities in the opportunity recognition definition. Building on the initial international opportunity concept of Chandra et al. (2009), Angelsberger et al. (2017) define international opportunity recognition as "the way an entrepreneur discovers the opportunity to exchange products and services with a new or existing partner in a new international market" (p. 25). Kraus et al. (2017) deal with the effects of entrepreneurial alertness, systematic search, prior knowledge, and social networks on first-time international opportunity recognition by entrepreneurs inside born global firms (BGFs) in line with Chandra (2009) on initial international opportunity recognition. Kraus et al. (2017) suggest several avenues for future research on international opportunity recognition, since their study has revealed that opportunities can be discovered through a combination of entrepreneurial alertness and systematic search. Furthermore, their study highlights how network relationships, entrepreneur's prior international knowledge as well as prior international experience are essential for entrepreneurs within BGFs because they can aid in identifying the initial international opportunity.

Other scholars argue entrepreneurs' capabilities to discover and create opportunities as being central to understanding the firm's international growth (Mainela et al., 2014; Anderson and Evers, 2015). Capabilities, as a concept, has been widely discussed by scholars both at firm and individual level. The capability-based view of literature (e.g., Teece, 2017; Helfat and Winter, 2011), has distinguished two main capabilities, i.e., operational capabilities as a "capacity to perform a particular activity in a reliable and at least minimally satisfactory manner" (Helfat and Winter, 2011, p. 1244), and dynamic managerial capabilities understood as "the capabilities with which managers build, integrate, and reconfigure organizational resources and competences" (Adner and Helfat, 2003, p. 1012). Research on IOR has made many efforts in understanding the influence of the founding managers' networks, entrepreneurial cognitions, and orientation on their ability to identify and exploit international opportunities (Zahra et al., 2005; Mainela et al., 2014; Muzychenko and Liesch, 2015). To encourage future research in this direction, Mainela et al.

(2014) propose several approaches such as creative-cognitive, context embeddedness, interaction-focused, and the practice approach to international opportunities with the view of entrepreneurship as effectuation logic (Sarasvathy 2001). The cognitive approach proposed by these authors lies in the changing perceptions and cognitive models of sense-making rather than static orientations in line with Zahra et al. 2005: *“International opportunity recognition is an iterative process, where the entrepreneur revises her (his) concept several times. These revisions are based on the entrepreneur’s intuition, formal and informal feedback from the market, and the results of trials and errors”* (Zahra, Korri, and Yu, 2005, p.139). In a similar vein of this cognitive approach, Muzychenko and Liesch (2015) offer a behavioural model focused on the key factors that determine an entrepreneur’s perception of international opportunity identification, specifically, knowledge and experience, risk perception, social network, and embeddedness. With respect to the practice approach (effectuation), Mainela et al. (2014) highlight how entrepreneurs’ actions convert uncertainties into opportunities based on the means available at the moment, and without trying to predict the future.

From the perspective of dynamic managerial capabilities, Anderson and Evers (2015) present a conceptual framework oriented to understand why certain individuals discover and exploit opportunities that others do not, and they also discuss whether the international opportunities are discovered or created. This is in response to calls to probe how the entrepreneur’s dynamic managerial capabilities such as managerial cognition, social capital, networking, human capital and learning capabilities overcome the liability of foreignness and the liability of outsidership inherent in a new international market entry (Helfat and Martin, 2015). In their conceptual framework, Anderson and Evers (2015) consider that most of the extant studies in IE literature at individual-level approach have found that opportunity recognition depends mainly on three key individual attributes of the entrepreneur, such as: (i) prior knowledge (Kirzner, 1997; Shane, 2000; Venkataraman, 1997), (ii) social networks (Ellis, 2000; Ozgen and Baron, 2007), and (iii) entrepreneurial marketing seeking behaviour and alertness (Kirzner, 1997; Shane, 2000). Prior international knowledge including education, experience from living abroad and from internationally oriented jobs, moulds the mind of the founder and lowers perceptions of uncertainty and, in particular, decreases perceptions of psychic distance to specific product markets (Johanson and Vahlne, 1977, 1990). Prior experience from similar settings helps to reduce uncertainty (Alvarez and Barney, 2005) in subsequent internationalization endeavours. Experience (from background, knowledge and networks) creates competencies that make entrepreneurs be alert to opportunities to combine resources from different national markets (McDougall, Shane and Oviatt, 1994), and experientially based competencies help alleviate liabilities of newness and foreignness (Mudambi and Zahra, 2007).

Within the IE literature, it is widely argued that a consciousness of foreign market opportunities is a result of the entrepreneur's prior international work experience, as entrepreneurs develop international relationships through gaining work experience overseas (Oviatt and McDougall, 1994; Bloodgood, Sapienza, and Almeida, 1996; Reuber and Fischer, 1997; Crick and Jones, 2000). The individual-level approach, based on Shane and Venkataraman's (2000) statement that opportunities are identified by individuals rather than by firms, claims that some individual aspects such as entrepreneurs' international orientation (Crick and Spence, 2005) social ties (Ellis, 2011), and behavioural (Tabares et al., 2020), affective, and cognitive aspects (Zahra et al., 2005; Muzychenko and Liesch, 2015) are the triggers for identifying international opportunities.

Regarding firms operating in Internet-based environments, recent research in the field of IE has emphasized the need for a better conceptualization of international opportunity recognition in this online context (Glavas, Mathews and Bianchi, 2017), advancing in the importance of IOR as a critical component for leveraging Internet capabilities and international market performance. In their analysis, these authors underline how international entrepreneurial orientation, international vision of the entrepreneur, Internet capabilities, and Internet-enabled networks are positively related with international opportunity recognition. This research highlights how firms achieve superior international market performance combined with understanding of how entrepreneurs make important decisions to identify and exploit new opportunities (Zahra et al., 2005). Recent research focused on digital firms identifies a new type of experience, named "digital internationalisation experience" (Dillon et al., 2020), and how this experience influences the way in which international opportunities are recognised and exploited by e-entrepreneurs. This study establishes the link between experiences acquired in business environments characterised by a high degree of digital involvement and enhanced opportunity recognition within the context of digital internationalisation. In turn, digital internationalisation experience contributes to enhanced international opportunity recognition for entrepreneurial individuals through increased idea generation and opportunity confidence.

However, IE research is particularly scarce in identifying and understanding which specific digital capabilities are developed by entrepreneurs in a way to explore and exploit international opportunities in Internet-based firms or born digital companies. Therefore, importing concepts from the digital entrepreneurship literature is much needed in the context of understanding internationalization of born digital firms so as to help capture the digital capability-building approach on an individual level in this case, the digital entrepreneur. We examine these concepts in the next section.

2.3 Entrepreneur's digital capabilities in Digital Entrepreneurship Literature

Digital Entrepreneurship (DE) is generally referred to as the pursuit of opportunities based on the use of digital media and other information and communication technologies (ICTs) (Reuber and Fisher, 2011; Nambisan, 2017). In line with Hull et al. (2007), “digital entrepreneurship is a subcategory of entrepreneurship in which some or all of what would be physical in a traditional organization has been digitized” (p.293), and thereby can be seen “as the reconciliation of traditional entrepreneurship with the new way of creating and doing business in the digital era” (p.293). It is necessary for digital entrepreneurs to be aware of differences, opportunities, and threats compared with traditional business models in order to be successful; otherwise, the digital venture is running considerable risk to fail. Wind (2008) states that digital businesses represent a “shift from traditional management approaches to ‘network orchestration’” (p. 23), as networks and communities are crucial for digital entrepreneurs. Moreover, several authors do not only describe new business models through digitalization but also deal with challenges and opportunities inherent in the emergence of new digital business models at hand. For example, Hair et al. (2012) mention that strong market orientation is essential for entrepreneurs to succeed in the dynamic and rapidly changing environment. Compared to traditional businesses, the development of digital start-ups follows steps of redefinition again and again. Digital technologies make it possible to create, modify and repeat product development phases much quicker than ever before. Experimentation and implementation processes are accelerated in nowadays digital economies and restart within much shorter periods. Thus, the digital entrepreneur faces increasingly dynamic paths, determined by diverse activities with uncertain time frames (Nambisan, 2017). Another step to foster success of a digital start-up in an early stage is to start networking and building up valuable social capital, whereby those network partners acquired throughout the career of the entrepreneur are most crucial (Spiegel et al., 2016). Moreover, the entrepreneur and his/her founding team are the essential part of the digital business in its infancy. Therefore, it is crucial to get the right and stable team together in order to be successful (Kraus et al., 2019).

Other authors have also made efforts to identify the 21st century digital skills dimensions of an entrepreneur (Van Laar, Van Deursen, Van Dijk and, de Haan, 2017) whereby they provide a framework with conceptual dimensions and key operational components. Their study identifies seven core skills: technical, information management, communication, collaboration, creativity, critical thinking and problem solving. Furthermore, five contextual skills are also identified: ethical awareness, cultural awareness, flexibility, self-direction, and lifelong learning. However, this framework suffers a lack of analysis of entrepreneurial skills, i.e., a person's innovation capacity and ability to perceive a new opportunity to market.

Other researchers analyze the “entrepreneur’s digital start-up mindset” as an extension of entrepreneurial mindset (Zaheer, Breyer, Dumay and, Enjeti, 2018). In their study, these authors underline the main characteristics of digital entrepreneurs, such as entrepreneurial orientation, opportunity driven, understanding of web and mobile technologies, global online marketplace, experimentation, and hands on both technology and business. This entrepreneurial attitude combined with a deep understanding of the scalable, open, born-global, generative nature of digital technologies are the factors that contributed to the success of digital start-ups. Although the success factors analyzed in their study do not focus on the internationalization process of digital companies, we have seen similarities with other studies of International Entrepreneurship (IE) literature. Namely, the human and social capital inherent in their education and work experience; the capacity to be more flexible, participative, and adaptive; and the capability to identify, evaluate and exploit entrepreneurial opportunities. Besides, the capabilities required in undertaking the digital entrepreneurial process may also be different. In fact, claims about the uniqueness of digital start-ups imply that the emergence of digital products/services requires a re-conceptualisation of human and social capital, organisations, ecosystems, and human behaviour in the start-up development process as “informed by the digital technology-perspective” (Nambisan, 2017). Digitalization creates social data (market networks) and intellectual data (market knowledge) about foreign markets earlier and faster than other methods, while also improving firms’ attractiveness, decision processes, and capabilities of decision makers (Clark et al., 2018).

Current research also evaluates which specific capabilities of a firm enable its internationalization process, with an emphasis on companies with exclusively digital products (Cahen and Borini, 2020). These authors based their study on a new construct named “international digital competence” (IDC) which consists of four critical capabilities to expand a digital firm internationally through an on-line presence: cross-cultural and programming skills, global virtual networks, cross-border digital monetizing adaptability, and international business model reconfiguration. Although these capabilities refer to the company level, it is obvious that there is a blurred line when they can be studied at individual level. In their study, Cahen and Borini (2020) also conceived that the digital firm’s strategy is moderated by the entrepreneur’s international orientation, given that most of the founders designed their business model and their strategies to reach international markets from the very beginning of the business.

Finally, very recent research also addresses how technological affordances, especially direct engagement with stakeholders, automation, network effects, flexibility and scalability, affect the internationalization of born digitals (Monaghan, Tippmann and Coviello, 2020). Their study underlines the potential to learn from other disciplines to revisit International Business Theory,

for example, research in digital entrepreneurship (e.g., Nambisan, 2017; Ojala et al., 2018) allowing to better understand how digital artefacts and features influence internationalization possibilities and behaviours.

In this context, born digital companies develop important distinctions regarding their entrepreneurs' digital capabilities to recognize international opportunities, which support and explain their distinctive internationalization processes. This suggests the need to better understand these digital capabilities and is an opportunity to extend the International Entrepreneurship field in a purely digital context.

2.4 Decision-making process in a digital context: causation vs effectuation approach

In IE literature, studies about managerial decision-making processes in international new ventures (INVs) and born global firms (BGFs) have been lately increasing in number, often focusing on the drivers of decision-making and the entrepreneurial orientation of these companies (Jones et al., 2011). Decision-making processes, and resultant decision outcomes can follow different logics due to the fact that decision-makers differ in terms of how they perceive the future, take action, evaluate risks and resources, and address uncertainty (Sarasvathy, 2001). From the foundational article on the effectuation topic in the *Academy of Management Review*, Sarasvathy (2001) introduced effectuation approach to describe how entrepreneurs behave when creating new ventures. In this seminal work, she differentiates between causation and effectuation to draw out their key elements. Causation processes take a particular effect as given and focus on selecting the means to create that effect. In contrast, effectuation processes take a set of means as given and focus on selecting between the possible effects that can be created with such means (Sarasvathy, 2001). In her sample, the expert entrepreneurs tend to shy away from prediction-based strategies; rather, they often (i) use a means-based approach, (ii) manage their level of affordable loss, (iii) forge partnerships, and (iv) leverage contingency (see Sarasvathy, 2008; Read and Sarasvathy, 2012). While effectuation is at its best in an unpredictable environment, causation is relevant in an easily predictable operating environment. It does not work particularly well, however, in a turbulent operating environment setting and in processes necessitating constant change (Sarasvathy, 2001, 2008; Sarasvathy and Dew, 2005). Thus, effectuation represents a considerable paradigmatic shift in understanding entrepreneurial behaviour and decision making at the stage of starting new businesses and/or acting under high uncertainty (Dew et al., 2009; Perry et al., 2012; Read et al. 2009; Sarasvathy, 2001).

The theory of effectuation has also expanded quickly into the domain of International Entrepreneurship (IE) and has shown its potential to help explain the phenomenon of SMEs' internationalization (Andersson, 2011; Chetty et al., 2013; Galkina and Chetty, 2015; Kalinic et

al., 2014; Sarasvathy et al., 2014; Schweizer et al., 2010). According to Sarasvathy et al. (2014), the effectuation-based framework developed by Schweizer, Vahlne, and Johanson (2010) makes an important contribution to IE research by providing a procedural view on opportunity exploration and exploitation in the importance of developing specific capabilities. According to Schweizer et al. (2010), entrepreneurs do create opportunities, but these opportunities are still the outcome of their previous learning, whereby, opportunity recognition results from the discovery of the hitherto unknown, from entrepreneurial alertness, and from a readiness to be surprised.

Some scholars have found evidence that effectuation and causation logics can actually work simultaneously in the same organization (Nummela et al., 2014; Evers and Andersson, 2019) providing insights on the co-existence of the two logics. Causation logic ensures that the venture stays focused and predicts what is predictable, while effectuation allows it to respond more flexibly to changes in its operating environment (Dew et al., 2011; Dew et al., 2009; Sarasvathy, 2008). Therefore, it seems that effectual decision-making is preferred in markets with high uncertainty such as turbulent transition markets (Mainela and Puhakka, 2009), or in situations when the market does not yet exist (Gabrielsson and Gabrielsson, 2013).

Due to the novelty of the phenomenon of born digital firms and their internationalization, the decision-making process to recognize and exploit international opportunities seems understudied in IE research. Therefore, further empirical studies on decision-making logic of digital entrepreneurs are needed in order to analyse how this type of decision-makers explore and exploit international opportunities. As mentioned above, the recent literature suggests that born digital firms tend also to be INVs or BGFs (Autio et al., 2017; Brouthers et al., 2016), because their products are “instantly accessible from anywhere in the world” (Brouthers et al., 2016, pg. 514). Accordingly, it seems that earlier studies on effectuation theories in internationalisation and international entrepreneurship (Chandra et al., 2009; Evers and O’Gorman, 2011; Andersson, 2011; Gabrielsson and Gabrielsson, 2013; Galkina and Chetty, 2012; Kalinic et al., 2014; Spence and Crick, 2006; Schweizer et al., 2010) might be a suitable reference to understand the decision-making logic underlying in a digital context for at least two reasons: First, because when we consider the specifics of International Entrepreneurship research in terms of the “Why? When? Where? How? How fast?” of the internationalization decision, some studies focus on at least three characteristics of conducting cross-border business activities: cross-border uncertainty, limited resources, network dynamics (Sarasvathy, Kumar, York and Bhagavatula, 2014). Secondly, because “effectual variables such as who the founding entrepreneurs are, what they know, and whom they know will also be important to IE research” Sarasvathy et al. (2014, p. 76).

The still quite scarce studies on decision-making logic in digital firms focus mainly on decisions concerning the business model design and how these decisions need to be made differently

depending on the venture development stage (Anagnou et al., 2019). Fewer studies focus, however, on how such digital business models evolve when entrepreneurs move to new digital platforms and how this evolution is related to effectuation and causation logics (Baber, Ojala and Martinez, 2019). Other studies try to integrate effectuation theory with causation and lean start-up method providing antecedents on how effectuation theory can be integrated with agile development and business model theory in a competitive environment and with significant resource constraints (Xu and Koivumäki, 2019). The digital environment presents challenges to the effectuation process in several ways. First, the disruptive nature of digital technology imposes a high demand of creativity and mindset shifting and the rapidly evolving digital environment calls for continual, frequent effectuation actions from entrepreneurs (Zaheer, Breyer, Dumay and, Enjeti, 2018). Second, new digital technologies not only present an opportunity to reconsider businesses' operational processes, but often redefine the conditions of success and rules of competition (Monaghan et al., 2020). Third, the variety of possibilities offered by digital technologies also means an increase in the number of possible means in the effectuation process (Nambisan, 2017).

Therefore, the key principles of effectuation, namely “Bird in hand”, “Affordable Loss”, “Crazy Quilt”, “Lemonade”, and “Pilot in Plane”, might also help deepen our understanding on the digital entrepreneurs' ability to recognize and exploit international opportunities, therefore effectual decision-making logic approach could provide a useful lens to understand the born digital firm's internationalization. In the present study, we try to integrate all these notions and ideas reviewed above aiming to a better understanding of how digital capabilities and effectual decision-making processes may affect early internationalization of a born digital firm.

3. Research Methodology

To gain further insights on how and why entrepreneurs with digital capabilities are able to recognize and exploit international opportunities, and how digital entrepreneurs' decision-making logic is applied in order to recognize international opportunities in a born digital firm context, we conducted our study using a longitudinal and interpretive approach in a single case setting (Yin, 2009). This approach emphasizes the individual interpretations and enables in-depth descriptions of the studied phenomenon (Walsham, 1995).

The single case study method is particularly helpful at revealing aspects of a phenomenon that has so far been largely inaccessible (Yin, 2009). This approach enables concentration on a single case over a period of time, necessary for an in-depth, intensive description, analysis, and interpretation of data. Besides, an interpretive approach provides a deeper insight into “the

complex world of lived experience from the point of view of those who live it” (Schwandt, 1994, p. 118). Overall, the aim of this research is to provide an extensive description of what is happening in this particular context (Walsham, 1995; Welch et al., 2011). Hence, our methodological approach may offer new insights in the subjects of International Entrepreneurship and Digital Entrepreneurship as well as Effectuation Theory and help us provide novel future research avenues for these streams of research.

3.1 Case selection and description

This is a longitudinal single case study. The case company (codenamed) is a Born Digital Start-up (BDS), operating in the e-healthcare sector. This company was formally established in 2017, but its entrepreneurial opportunity originated in January 2015. We selected our single case by applying mainly three criteria: first of all, the research set the requirements to gain insights on entrepreneurs’ digital capabilities in which decision-making logic evolved during a long period of time. Conducting rigorous longitudinal studies demands a considerable time and effort to collect and interpret data over a long period time. Therefore, access and having long-term relationships with the case firm was an important asset. Secondly, the company is one of the first B2C and B2B digital platforms in Spain in the healthcare and nutrition sector. Therefore, an innovative business idea was another prerequisite. The third requirement was to select a company that from the initial phases (pre-launch) might apply digital technologies that could influence decision-makers at recognizing international opportunities. The born digital firm’ internationalization process, and how the digital technologies affect entrepreneurs to recognize and exploit international opportunities is an understudied but significant topic both in recent International Entrepreneurship and Digital Entrepreneurship literatures. The organization we chose fitted these selection requirements.

3.2 Data Collection

The data collection process was iterative, following the recommendations by Walsham (1995). Data collection took place over a period of approximately 23 months, from October 2018 to August 2020, as shown in Figure 1. We collected empirical material covering the entire history of the case firm, from 2015 to 2020. The primary data collection method was in-depth interviews conducted with the two founders, who have worked on the opportunity process from the beginning till August 2020, and with two members of the management team, financial director and R&D director. Data were obtained through studies of internal and public documents, a total of 10 semi-structured interviews, discussions, and observations, particularly involving: Chairman (codenamed founder 1), CEO/CTO (codenamed founder 2), financial director, and R&D director (see Figure 1).

Because the case firm is relatively small, 8 interviews with the two founders (Chairman and CEO/CTO) formed the main source of information. However, to improve the validity of the study, to avoid personal bias, and to gain the most relevant information on each topic (Huber and Power, 1985), we interviewed two additional managers in the firm. The interview questions were designed for inducing lived experiences while using a case study protocol. All interviews were initiated by asking questions covering a broad range of topics, inquiring about firm history, job roles and personal skills, current and potential international projects, team, clients and environmental interactions, changes and new services and technology development infrastructure. The interview method was selected because it emphasizes individual interpretations of the actions and events related to the phenomenon (Walsham 1995, p. 78). Moreover, the use of open-ended interviews may raise novel insights and, in doing so, promote theory building of the phenomenon (Suddaby et al., 2015).

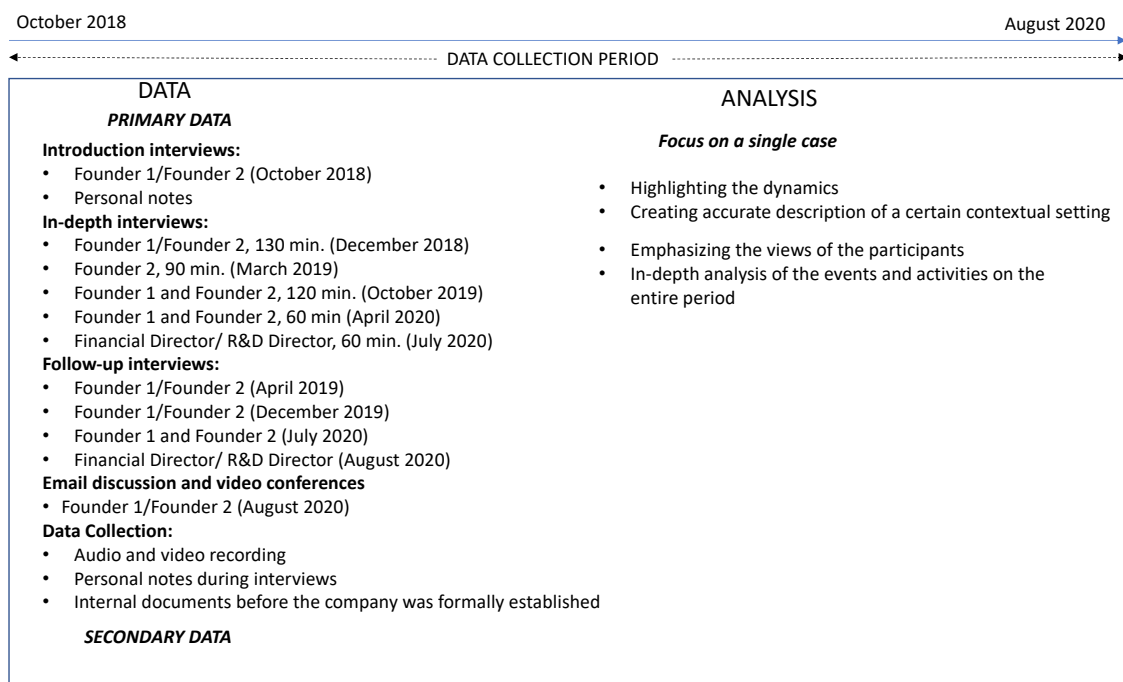


Figure 1. Data Collection Period

The introductory interview with the two founders took place in October 2018. This introductory interview focused on the initial establishment of the firm, the development of the business and technical strategy, as well as on potential international business development. The first in-depth interview with the two founders took place in December 2018, and the founder 2 was interviewed later again in March 2019 separately. In October 2019, a third in-depth interview took place with the two founders with the objective of contrasting the information collected in the first interviews and analysing in depth the changes that were taking place in BDS from the initial business idea. Likewise, to avoid personal bias, and to gain the most relevant information on each topic (Huber

and Power, 1985), the Financial Director and the R&D Director were also interviewed in July 2020. Each in-depth interview was subsequently contrasted by follow-up interviews. The follow-up interviews were conducted from 2019 until 2020 and were focused on the development of the business and technical strategy and operations, as well as on international business development, since the previous interview.

The interviews took place in the office space of BDS, which was situated at that time in TecnoCampus (Universitat Politècnica de Catalunya, UPC) in Barcelona. The duration of the first in-depth interview with the two founders was 130 min, the founder 2 interview was for 90 min, whereas the third interview was 120 min. The interviews were tape recorded and transcribed into word documents. Interview questions were related to (i) the personal education, digital capabilities, international orientation, and work histories before the initial opportunity discovery, (ii) motives for working with the opportunity, (iii) the description of the events and activities during the start-up BDS creation and after the legal establishment, and (iv) the current state of the international opportunity recognition at the time of the interview. In addition, these interviews included informal discussions on international entrepreneurship and innovation. Notes were also taken during the interviews, for instance, on the general atmosphere of the interviews and the mood of the interviewees.

To avoid retrospective bias (Huber and Power, 1985; Miller, Cardinal, and Glick, 1997), we collected several types of secondary data, covering the entire history of the firm, with a view to validating the interview data whenever possible. The data included internal and external memos of the firm, such as a commercial and financial information from the year of its establishment, promotion materials for potential partners, press releases, video materials for advertising purposes, websites, brochures, and social media publications.

3.3 Data Analysis

The data analysis period covers the timeframe from the initial business idea in January 2015 until August 2020 in a single case company in the e-health sector. We adopted the Gioia method (2013) for data analysis. This method is inductive in nature and allowed us to iterate between data and theories (Eisenhardt and Graebner, 2007). Three data analysis steps were undertaken.

First of all, we organized the case firm's development phases putting critical events in chronological order. Longitudinal research should preferably be an objective illustration of past events. Thus, we followed Pettigrew (1990), in order to gain a clearer view of the causal links between critical events in chronological order. By means of this process, we were able to arrive at a historical and evolutionary review of the firm.

Secondly, we attempted to identify how interviewees understand international opportunity recognition in their company through first-order analysis. This analysis is similar to Strauss and Corbin's (1998) notion of open coding (Gioia, Corley, and Hamilton, 2013). We repeatedly read the interview transcripts to capture the informants' meanings. During this process, we coded and compiled the initial coding table. We thus derived a set of first-order concepts that represented informants' views of what was going on in the case setting (Van Maanen, 1979). In order to trace the connection between international opportunity recognition and entrepreneurs' digital capabilities, we used as a template the framework proposed by Nambisan (2017) about the intersection of digital technologies and entrepreneurship, and the framework created by Zaheer et al. (2018) for the founders' perspectives on achieving "TrAction (trajectory and action)" in digital start-ups. For a more detailed coding of actions related to the decision-making process, we used the framework created by Sarasvathy (2001) and Sarasvathy et al. (2014) on intersection of international entrepreneurship and effectuation research: (1) means-driven actions (means-at-hand), (2) prevention of big losses by trying to avoid committing more resources than a firm can afford to lose (affordable loss), (3) interaction with other people (networking) (4) leveraging uncertainty by treating surprises as opportunities (flexibility), and (5) the formation of partnerships and alliances (pre-commitment).

Thirdly, through the second-order analysis, we endeavoured to find theoretical interpretations for the first-order concepts derived in Step 2. We shifted back and forth between the derived concepts, the themes emerging from the concepts, and extant literature on international opportunity recognition for theories that could help us better understand the concepts and themes. The first-order concepts were clustered and linked to second-order themes, which allowed identification of more fine-grained categorization of entrepreneurs' digital capabilities and their decision-making logic at recognizing international opportunities during the entire phases of the firm. This step is iterative in nature. We engaged in repeated comparison and contrast of the first-order concepts, looking for both similarities and differences between them. We made conscious efforts to identify theoretical differences between the concepts so that we could group and congregate similar first-order concepts to allow second-order themes to emerge. Consequently, these second-order themes became the notions we used to "explain the patterning of the first-order data" (Van Maanen, 1979, p. 541).

As the second-order themes emerged and we gained a better understanding of both entrepreneurs' digital capabilities and their decision-making logic at recognizing international opportunities, we began to see if we could cluster and link the second-order themes into aggregate dimensions. For the purpose of our study, we were opened to using concepts identified in previous research to summarize the second-order themes and aggregate dimensions, a practice also embraced by Pan

and Tan (2011). It was in this effort that we discovered that the second-order themes emerging from this study could be further categorized into aggregate dimensions related to the development of the entrepreneurs' digital capabilities and their decision-making logic. Finally, we wrote down the entire case story, with supporting quotations, as a longitudinal narrative. This helped us to serve as a foundation for our theoretical model.

The data structure presented in Figure 2 summarizes the first-order concepts, second-order themes, and aggregate dimensions we derived from Steps 2 and 3.

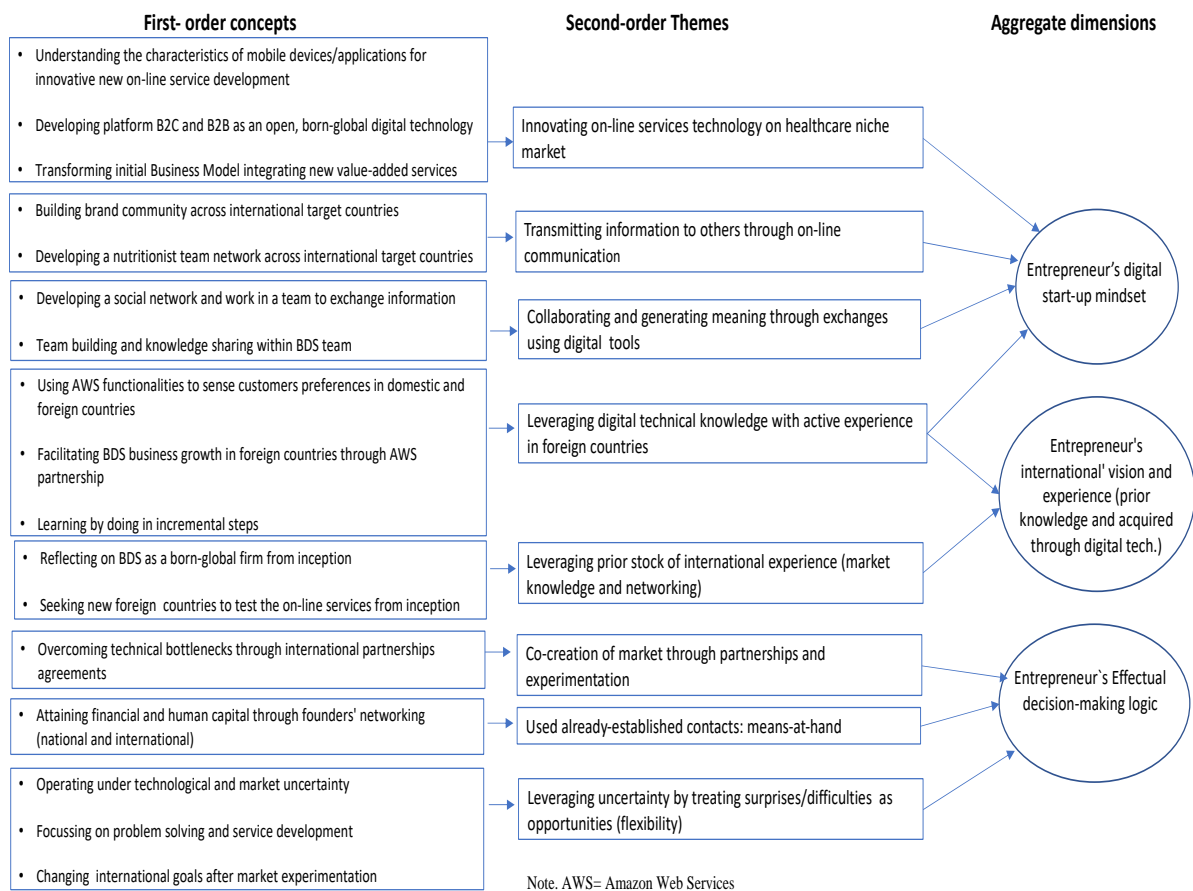


Figure 2. Data Structure

4. Findings

In this section, we first present the background of the case firm and entrepreneurs. Thereafter we present the findings based on our research questions: how and why entrepreneurs with digital

capabilities are able to recognize international opportunities, and how the digital entrepreneurs' decision-making logic is applied in order to recognize international opportunities.

4.1 Background of the case firm and overview of the critical events and activities of BDS

The case company (codenamed Born Digital Start-up, abbreviated BDS) is a Born Digital Start-up based in Spain operating in the healthcare and nutrition sector. BDS was formally established in 2017, but its entrepreneurial opportunity originated in January 2015. The business opportunity was based on the diagnosis of food allergies and nutrition as one of the founders suffered from this problem himself. It seemed that there was no mobile application at that time that would provide real-time information to detect possible food allergies after performing a diagnosis of the product components by scanning the barcodes. The initial BDS's business idea was grounded on a healthcare and nutrition advising mobile application to provide healthy habits and nutrition for end-consumers. During the pre-launch period (2015-2017) the initial business idea evolved towards a digital platform not only oriented to the end consumer, but also to the food industry. The platform was launched in 2017 to operate both as a Business-to-Consumer (B2C) and Business-to-Business (B2B) model. BDS has been engaged in several development projects of healthcare mobile application solutions in Central America and Continental Europe from its idea generation phase.

To shed light on the two founders who have been working on the opportunity from the beginning, Table 1 outlines their main characteristics on prior stocks of educational background, technical experience, and other work experience. The founder 1 and Chairman of BDS was an entrepreneur and owner of a chemical company in the industry sector until a few years ago, when he decided to sale it and to start the BDS project. Moreover, he had participated in other entrepreneurial projects in technological initiatives in the United States and Central America as an investor. The founder 2 and CEO/CTO started working in Communication and Audio-visual industry for several years in different positions. During his tenure in these companies, he constantly travelled around the world in several projects. He decided to start BDS project as a niche market opportunity and he worked full time on technological development from the beginning. Currently, he is CEO and CTO in BDS, although the firm hired an ICT responsible to support him.

	Job Role	Age Range	Gender	Highest level of education attained	Prior Technical experience	Other work experience	Role in Pre-start up BDS creation	Role after establishment and inception operations
Founder 1	Chairman	45-55	Male	Bachelor's degree Economics	Yes	Entrepreneur/Owner International Projects	Commercially oriented Knowhow	Commercially oriented/Networking and partnership oriented
Founder 2	CEO/CTO	45-55	Male	Bachelor's degree Communication	Yes	Communication Director International Projects	Technological Knowhow (hands-on knowledge)	Technology oriented/Artificial Intelligence partnership/ Strong attachment to the international opportunity

Table 1 Presentation of the entrepreneurs

The phases from pre/start-up BDS creation to the establishment and inception of operations containing the critical events and activities related to international opportunity recognition are described in Figure 3 in chronological order. Grounded on the findings, during the pre/start-up BDS creation process, we identified four stages: (1) entrepreneurial opportunity creation (2) application development and problem solving, (3) market experimentation, and (4) business model reconfiguration. After the company was formally established, we identified four stages that characterized this post-establishment phase: (1) technology and resource partnering, (2) platform redesign, (3) commercialization at the home country and (4) international market development.

In the next sections, we present the key findings based on our case study contributing to the international opportunity recognition in chronological order.

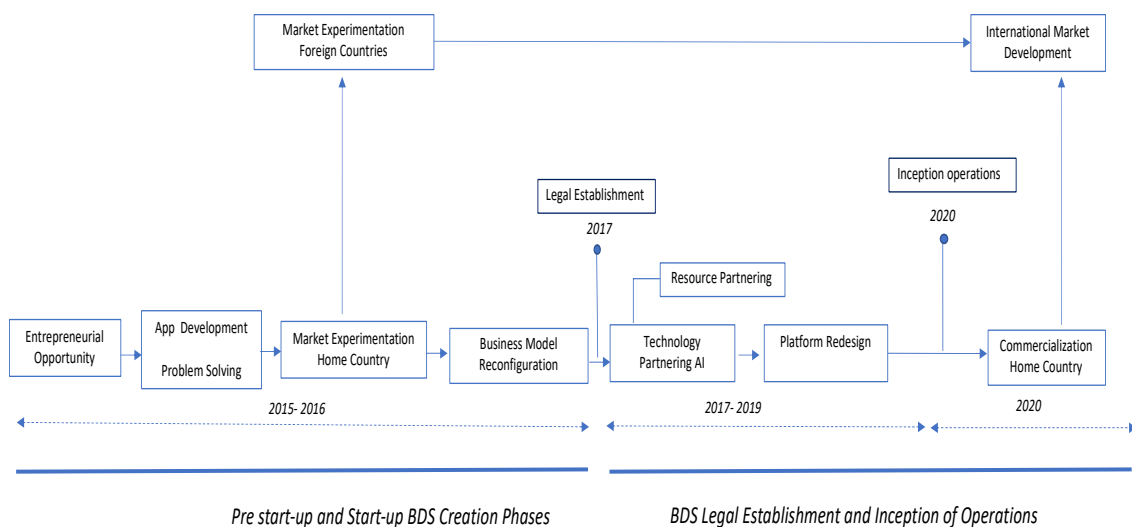


Figure 3. Background and critical events and activities of BDS

4.2 Entrepreneurs' Digital Capabilities and International Opportunity Recognition

4.2.1 Entrepreneurs' Digital Capabilities at Start-up creation

BDS' business idea presented a fairly innovation service to the healthcare and nutrition market on-line services. It was an idea with huge business potential due to the scarce existence of digital applications in the market that offered an online service to end-consumers on the diagnosis of food allergies and nutrition. In the pre-start-up and start-up phases of the venture, the founders worked on application development and solving problems related to a specific health on-line service, and they immediately focused on market experimentation, both in the home country and in the potential target countries. Their main goal was to devise an innovative healthcare digital service breakthrough to address a diagnosis through technological innovation.

Nevertheless, its development in practice faced several difficulties, notably the fact that the resources needed for the services were not available in Spain at the time. The first difficulty was raised by the application database and how to gather information about food products and their components with a high level of detail. This severely limited the number of potential target countries. Consequently, BDS started to seek countries where potential technological partners could provide the database information according to the application development requirements. The CEO/CTO commented on this in 2018, as follows:

“Despite the fact that BDS was conceptualized as a global firm, during the testing phase of the application, we identified an important entry barrier for the early internationalization of the company, since the product databases in each country should have qualitative and quantitative data (i.e., allergens) that allowed validating the algorithms to give off a correct diagnosis. We had to re-think our internationalization strategy.”

Despite the two founders predicted that their digital services would create value for foreign customers and that they could be sold in several foreign markets, the main challenge was to acquire a database to solve the technical and strategic bottlenecks. Initially, the founders focused on developing their own database, but limited resources in Spain led them to make changes to their strategic plan. The founder 1 commented on this as follows:

“The innovation capacity and ability to perceive new opportunities to market were the main challenges for us in the pre-launch period. Probably we were wrong in our initial strategic plan both in Spain and in foreign countries because we mainly focused on technological issues from the beginning”.

As a result of the market experimentation in Spain and in foreign countries, the founders highlighted the importance of changing their original digital business model to reach new users

in Spain and foreign markets. As the CEO/CTO said: *“We started as a B2C platform, but after the testing in Spain and other countries in Central America and Europe, we were forced to quickly develop B2B digital services to meet the high demand of potential food industries testing services in our platform. After we went to Mexico, we changed the business model to become a company that provides digital services based on B2B solutions, which can be integrated into any software or platform”*. Thus, the initial business idea had to be transformed into a platform incorporating new B2B services.

The CEO/CTO and the management team decided to reconsider the firm’s strategy and to reconfigure the business model in order to adjust this opportunity in the domestic and international context. The CEO/CTO commented: *“Our business model reconfiguration allowed us fast engagement in changing opportunities of digital technology innovations across international markets. Our flexibility and testing redesign enabled to rapidly abandon losing initiatives”*.

Based on this situation, new designs, processes, and routines needed to be worked out and adjusted within the new business model in accordance with the firm's domestic market and international targets. Therefore, as a result as the market experimentation phase, the company focused on launching the new platform based on B2C and B2B model, and the two founders reoriented the international strategy focusing only on two countries, México and France, where the required database was available to be integrated in the platform through partnership agreements.

Summing up, during the Start-up BDS creation, the CEO/CTO’s technological capabilities and the two founders’ international vision and prior international experience in the target countries played a dominant role used to build the technology infrastructure and to integrate business processes. The two founders reflected on BDS as a born-global firm from idea generation process, which led them to define an early internationalization strategy. The founders began a market experimentation process on the application both in the domestic market and in the target countries in Central America and Continental Europe where they gained prior work experience in other ventures. During this phase of experimentation, the founders identified technical bottlenecks regarding to database. To solve this problem, first of all, they redefined the business model by incorporating new services and scaling the mobile application towards a B2C and B2B platform. Secondly, they revised the company's internationalization strategy, focusing only on those countries where they could reach agreements with partners that could provide a customized database according to the technical and strategic requirements of new business model. This opportunity seeking behaviour was linked to the ‘opportunity driven mindset’ of the two founders, and therefore included the willingness of the entrepreneurs to seize new opportunities.

Thus, the findings related to the Start-up BDS creation phase indicate that both founding entrepreneurs demonstrate a deep understanding of the characteristics of mobile devices and applications, developing a new platform incorporating new value-added services. The founders emphasized having a vision and purpose based on solving technical problems focusing on a limited range of activities while pursued iterative service development. Furthermore, the findings indicate that relationships with potential international partners to test the platform were crucial to overcoming technical bottlenecks.

4.2.2 Entrepreneurs' Digital Competencies at BDS establishment and inception of operations

Since the formal establishment of BDS in 2017, the entrepreneurs faced new challenges in the company development. First of all, it was necessary to create a stable team and incorporate a scientific director who was an expert in nutrition. As a digital start-up firm, BDS lacked credibility in negotiating with renowned experts. The CEO/CTO commented on this in 2018, as follows:

“The negotiation process was crucial at this moment, since the major goal before the launching was to create a nutritionist’s network in Spain, Mexico, and France. We finally hired a R&D Director, Ph.D. in Nutrition and Cardiovascular diseases from an important Centre of Research in Spain”.

Secondly, as the platform incorporated new technological requirements, it was necessary to pursue a technological partner expert in Artificial Intelligence (AI). The project was becoming more complex and a partnership with an AI provider was required to create new value-added services according to the new business model. The final AI partnership agreement was signed with a Spanish University Incubation Centre in 2019, and the platform re-design process started to validate the new services to launch it.

The CEO/CTO and the management team began to seek new partnership agreements to drive the growth in the home country and the firm’s globalization. During this time, the third challenge was financing the firm since BDS did not have the financial resources initially to develop the new technological requirements on its own. Although they had a large network of contacts to enable knowledge leveraging, capital remained their greatest challenge. Because of this, the potential partners in the target countries were contacted directly, with efforts to convince them of the value of the platform services, and demonstrations of how it would benefit their business. Despite subsequent investor activity, the founders were determined to maintain majority ownership to guide the firm’s strategic growth and development. The two founders expressed a goal of

international growth; however, detailed planning was not its main focus. The founder 1 commented on this in 2019, as follows:

“The most crucial thing for the company’s international growth was grasping opportunities when they turn up. Thus, the most important aspect for establishing an international partnership was to find stakeholders whom the firm could trust and who could deal with unexpected incidents”.

During 2020, an initial agreement was signed with the Amazon Web Services to enhance the new skill of Amazon’s Alexa application for the commercialization of the company's services. Amazon Web Services (AWS) is a subsidiary of Amazon providing on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis. These cloud computing web services provide a variety of basic abstract technical infrastructure and distributed computing building blocks and tools. AWS operates from many global geographical regions including North America. This new partnership agreement with AWS has been a crucial milestone for BDS in several ways: first, BDS have integrated AI as a key part of its algorithms to offer new value on-line services. Second, due to AWS operates from global geographical regions, BDS has started its new platform commercialization and international market development during 2020. Third, the company is nowadays sensing customers preferences using AWS functionalities both in domestic and foreign countries. The two founders commented on this in 2019, as follows:

“Our business strategy before the new platform launches focused on offering value-added customer- oriented services (B2C and B2B services) to lower business barriers, both in home and foreign countries. Then, we initiated the negotiations with AWS in order to facilitate our business international growth integrating the new skill of Amazon’s Alexa application”.

Therefore, after the BDS legal establishment, the two founders emphasized their efforts to create a stable team and incorporating a scientific director to enhance new value-added services based on AI algorithms before the new platform’s launching, both in Spain and target countries. Likewise, the two founders focused on building a brand’s community (access to end-customers, suppliers and partners), since the main goal was to build up an international network to support the new services created in the platform at this time. Thus, the on-line communication capability through developing a social network and working in a team to exchange information was essential for business growth both in Spain and in foreign countries. The findings also show that entrepreneurs' innovation capability can facilitate the creation of value-added services (e.g., incorporating artificial intelligence features). However, the development process of the new value-added services was supported on incremental step learning process both in Spain and foreign countries where the platform was being tested.

Entrepreneurs also focused on how the international business development might be accelerated. For this challenge, the partnership agreement with Amazon Web Services to develop a new skill in the platform was decisive. The findings show how the entrepreneurs' international vision enabled BDS to pursue new international business opportunities through the partnership with AWS. The findings point to the entrepreneurs' propensity to enhance the BDS international growth by leveraging their knowledge of digital technologies features and international experience in the target countries (e.g., using AWS functionalities to sense customers preferences in domestic and foreign countries). The findings also demonstrate how the interplay between their knowledge of digital technologies features and their international experience in the target countries relate to a better understanding to solve-problem issues.

4.3 Entrepreneurs' decision-making process to recognize international opportunities

In this section, we analyse the case results on decision-making process from BDS' entrepreneurial opportunity originated in 2015 to the inception of operations in 2020. As mentioned above, the entrepreneurial business idea was a health and nutrition mobile app to advise healthy habits and nutrition to end-consumers. The two founders had no scientific knowledge in the fields of healthcare and nutrition, although they had been involved in digital ventures in Spain and abroad in other fields. The founders identified the objective of the solution and leveraged their technical knowledge with the scientific assessment from external experts in healthcare and nutrition. Their international background and international experience in other digital ventures in Central America and Continental Europe led them to conceptualize BDS as a born-global firm to initiate the internationalization process from inception. However, their decision regarding the pace and sequence to enter foreign markets in BDS's internationalization strategy took some barriers such as language, cultural and geographical distances as a limitation to develop company internationalization. The two founders commented on this in 2018, as follows:

“Our international strategy was planned based on our prior experience in those markets where we had some knowledge and we decided to initiate our international activity in Central America and Continental Europe to overcome barriers such as language, cultural and geographical distances. However, we also knew that technological uncertainty was a relatively strong factor for us due to our innovative application solution. We had to reorient our internationalization strategy several times.”

Subsequent steps during the start-up BDS creation phase focused on market experimentation in those countries where the database was available to integrate into the new platform. The

partnerships agreements with companies in order to co-create the market and market experimentation in these countries were critical to advance in the application development.

Despite that initial decision-making process to recognize the international opportunities could be conceived as a planned process, evidence shows that the uncertainty environment and the technical bottlenecks found during the database development were critical factors to re-shape the decision-making logic. Market co-creation through partnerships and experimentation were key aspects to considering an effectual rather than causal decision-making logic. In addition, the findings indicate a high degree of flexibility on the basis that the entrepreneurs decided to change the BDS' international strategy and business model to cover new business situations and to engage new international users in accordance with the firm's strategy (e.g., food industry companies).

After the legal establishment of the company, the founders attained financial and human capital through their network. Through personal contacts, the CEO/CTO recruited a scientific director for developing new value-added services. The entrepreneurs also signed a partnership agreement with the University Incubator Centre to integrate artificial intelligence on the platform and with Amazon Web Services. The CEO/CTO commented on this in 2020, as follows:

“Our main challenge to expand our business internationally was to create new services and algorithms based on AI, as well as to boost the platform abroad. We rapidly engaged in conversations with a variety of people who already knew our platform, or they were personal contacts”.

The findings demonstrate an effectual decision-making logic through the formation of partnerships and alliances (pre-commitment) and means-driven actions (experimentation). The two founders focused on “means at hand” approach rather than on a predictive analysis to recognize international opportunities and to develop international markets. The findings also demonstrate how the two founders focused on what they can afford to lose rather than on prediction of possible gains. By focusing on affordable loss, the need to predict future returns is eliminated, thus the founders employed less time engaged in planning.

5. Discussion

This study examined e-entrepreneurs' digital capabilities and their decision-making process to recognize international opportunities in a born digital firm context. We established the relevance of entrepreneurs' digital capabilities and their decision-making logic for the fields of Digital and International Entrepreneurship, as well as from the lens of effectuation theory, which has been little studied.

For the entrepreneurs' digital capabilities development, our case findings show a digital start-up mindset characterized predominantly by an understanding of digital technologies, such as web and mobile applications, and AI as an innovative digital technology to create value-added services in a global on-line marketplace. Moreover, entrepreneurs' digital start-up mindset was underpinned on creativity, collaboration, problem solving and on-line communication capabilities, demonstrated during the BDS creation and launching the platform. Besides, the founders conceptualized BDS as a born-global firm grounded on their international vision and prior international experience. Likewise, their international experience acquired through digital technologies enhanced the international opportunity recognition. The founders aggressively and actively explored new business opportunities in international target markets from the early stages of BDS' creation.

Regarding the decision-making logic at recognizing international opportunities, our case findings show that the effectuation logic was the dominant path to decision-making in the key stages from BDS creation phase to launching the platform. The entrepreneurs demonstrated opportunity driven mindset, flexibility and means-driven actions. We also find that a direct lack of prior technical knowledge of several bottlenecks in the stage of the application development forced entrepreneurs to mainly act in effectual ways throughout market experimentation and learning by doing in incremental steps.

5.1 Entrepreneur's digital start-up mindset at recognizing international opportunity

The pursuit of international opportunities within born digital firms may enable entrepreneurs to develop digital capabilities based on the fact that a digital firm can be indeed international from the very beginning (Brouthers et al., 2016; Kotha et al., 2001; Loane et al., 2004). Technical affordances of digitalization such as direct engagement with stakeholders, automation, network effects, flexibility, and scalability let these firms operate to a very high degree 'in space', and their connection to markets around the world can be nearly instant (Monaghan, Tippmann and Coviello, 2020). Prior research asserts that Internet capabilities can enhance the firm's ability of identifying international opportunities (Reuber and Fischer, 2011). Glavas et al. (2018) argue, however, that simple 'use' of the Internet will not be sufficient for achieving international market performance. Instead, firms are often forced to become more innovative to take advantage of international market opportunities in an online environment. In line with this, our findings show which digital capabilities in particular enable entrepreneurs to pursue international market opportunities within a born digital firm.

Our findings support Zaheer et al.'s (2018) entrepreneurs' digital start-up mindset framework, highlighting the main characteristics of digital entrepreneurs, such as entrepreneurial orientation, opportunity driven, understanding of web and mobile technologies, vision of a global online marketplace, experimentation, and hands on both technology and business. Specifically, BDS' digital entrepreneurs adopted a vision on innovating on-line services technology in a niche market, transmitting information to others through on-line communication, collaborating and generating meaning through exchanges using digital tools, building a brand's community, and building networking on target countries to integrate their technology (see Fig. 4). These findings also support Nambisan (2017), who argue that the capabilities required in undertaking the entrepreneurial process may also be different due to the fact that the emergence of digital products requires a re-conceptualisation of human and social capital, organisations, ecosystems, and human behaviour in the start-up development process. This is in line with prior studies indicating that it is necessary for digital entrepreneurs to be aware of differences, opportunities, and threats compared with traditional business models in order to be successful, otherwise, the digital venture is running considerable risk to fail (Hull et al. 2007).

Similarly, our findings concur with Wind (2008) who found that digital businesses represent a "shift from traditional management approaches to 'network orchestration'" (p. 23), as networks and communities are crucial for digital entrepreneurs, and with Hair et al. (2012) who argue that strong market orientation is essential for entrepreneurs to succeed in the dynamic and rapidly changing environment of born digital firms. Therefore, we propose:

Proposition 1. *In born digital companies, entrepreneurs develop a digital start-up mindset that fosters the International Opportunity Recognition.*

5.2 Entrepreneur's international' vision and experience at recognizing international opportunity

As mentioned above, many born digital firms are international from the very beginning because their connection to markets around the world can be nearly instant (Monaghan et al., 2020), and this imply that digital entrepreneurs develop digital capabilities as our findings support in this study. However, research also suggests that in an Internet-based environment, decision-makers with an international mindset and higher levels of international vision are more global in nature and tend to outperform those without such an international vision (Johnson, 2004; Andersson and Evangelista, 2006). The international vision of the entrepreneur is argued to be an important component in the firm's international expansion enabling the firm to identify new international opportunities, which may have not been previously considered (Nummela et al., 2004). In many

instances, it is the entrepreneur's drive and vision that allows firms to expand into international markets and seek out new international business opportunities.

In line with these scholars, our findings show that BDS' entrepreneurs conceptualized their digital business internationally from the idea generation process, transforming their business model and their strategies to reach international markets from the very beginning of the business lifecycle. These entrepreneurs also highlighted their global ambitions and willingness to take risks in foreign markets. They were actively pursuing foreign digital users and digital sales, and they actively adapted the digital services to foreign languages and users' preferences.

Similarly, our findings concur with Jones and Casulli (2014) who argue that prior knowledge (experience) is widely identified as influential in internationalization. It is then an attribute or knowledge resource of key individuals within the firm that influences internationalization decisions. Very recently, Dillon et al. (2020) have identified a new type of experience, named "digital international experience" as a type of experience encompassing both technical and international dimensions of business knowledge, and show how this "digital international experience" enhances opportunity recognition within the context of digital internationalization. Our findings also point to the entrepreneurs' propensity to deal with problem-solving issues by leveraging their knowledge of digital technology features and international experience acquired in the target countries (see Fig. 4). Besides, the founders developed experientially based digital competences during the start-up creation and launching processes in order to help alleviate liabilities of newness and foreignness. Thus, a link between international vision, prior stock of international experience, and international experience acquired through digital technologies enhanced international opportunity recognition by the entrepreneurs of our investigated firm. Therefore, we propose:

***Proposition 2.** In born digital firms, the interplay of entrepreneurs' international vision, prior international experience and international experience acquired through the deployment of digital technologies have a positive moderating effect on the International Opportunity Recognition.*

5.3 Entrepreneur's effectual decision-making logic at recognizing international opportunity

From all stages of the entrepreneurial process, from idea generation to inception of operations, BDS' digital entrepreneurs engaged in processes of effectuation and co-creation with stakeholders in market experimentation because of the lack of pre-existing markets (Saravathy, 2008). Although the founders originally intended to engage in rational decision-making (e.g., initially planned sequence to enter in foreign markets), the inherent uncertainty present in the digital global

market and their lack of healthcare business “know-how” motivated them to become highly trustful on effectual means to recognize the opportunity internationally (see Fig. 4). These findings concur with Sarasvathy and Dew (2005), who argue that entrepreneurs attempt to exercise control over what can be done with available resources (effectuation rationality) rather than decide what ought to be done given a set of predictions about what happens next (predictive rational view).

Also, in line with Sarasvathy (2001), our findings show that effectuation can therefore be more relevant in the context of uncertainty environments because it copes well in front of risky situations; through experimentation and flexibility, effectuation activities can be modelled by the entrepreneurs. We find that BDS’ digital entrepreneurs were focusing on what they can afford to lose rather than on prediction of possible gains during all stages of the venture. An effectual approach risks only resources that can be affordably lost; thus, it also drives partnerships as the central method to expand resources. We find that the company’s founders forged partnerships to overcome technical bottlenecks, to create new value-added services, and to launch the platform abroad. These findings are consistent with Ojala et al. (2018) internationalization model for digital platform providers in which it is demonstrated how digitalization creates possibilities but, at the same time, sets limits to the global expansion of digital-based INVs. Accordingly, digital entrepreneurs’ decision-making process is driven to focus on foreign market entries where the required technical resources are available, and their firms can extend their resource base through collaborative network relationships and exchange important resources with partners. Therefore, we propose:

Proposition 3. *During the creation and launching processes of born digital start-ups, entrepreneurs with a digital start-up mindset are more likely to follow effectual than causal decision-making logic at recognizing international opportunities.*

Drawing on the case findings, we propose a theoretical model of how and why the entrepreneurs’ digital capabilities are developed in a way to enable a firm to recognize international opportunities and their decision-making logic within an internationalizing born digital start-up (see Fig. 4).

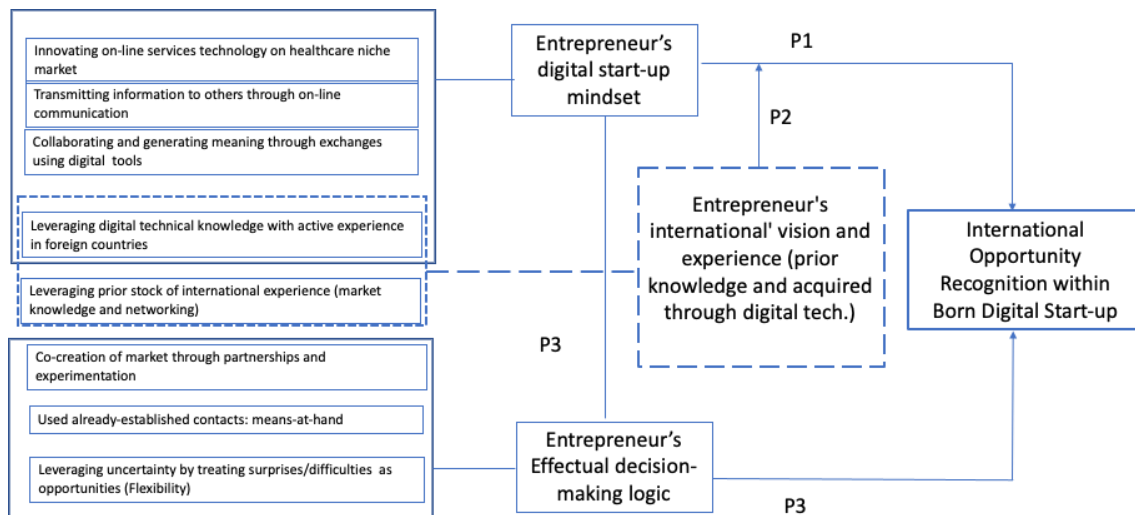


Figure 4. Theoretical model and propositions

6. Conclusions

This longitudinal single case study has empirically examined how and why entrepreneurs with digital capabilities are able to recognize and exploit international opportunities, and how digital entrepreneurs' decision-making logic is applied in order to recognize international opportunities in a born digital firm context. We contribute to and expand on existing International and Digital Entrepreneurship fields literature and theory and practice in several ways. First of all, the study extends the Digital Entrepreneurship theories on factors impacting on the propensity of internationalization of new ventures, stressing the influence of entrepreneurs' digital capabilities (Nambisan, 2017). Digitalization creates social data (market networks) and intellectual data (market knowledge) about foreign markets earlier and faster than other methods, while also improving firms' attractiveness, decision processes, and capabilities of decision makers (Clark et al., 2018). Here, we extend this by demonstrating how and why entrepreneurs with digital capabilities are able to recognize and exploit international opportunities in a born digital firm context. International opportunity recognition is in our study viewed broadly as an iterative and complex process comprising interwoven aspects of search, discovery, and creation, and overlapping with international opportunity evaluation, development, and exploitation (Chandra, Styles, and Wilkinson, 2009) whereby the individual plays a central role in line with Shane and Venkataraman (2000) approach. Here, we expand this view within an internationalizing born digital start-up in which the "e-entrepreneurs" or digital entrepreneurs have to develop a "digital start-up mindset" characterized predominantly by innovating in on-line services technology in a niche market, transmitting information to others through on-line communication, collaborating and generating meaning through exchanges using digital tools, building a brand's community,

and building networking on target countries to integrate their technology. This suggests the need to better understand these digital capabilities and it becomes an opportunity to extend the International Entrepreneurship field in a purely digital context.

Secondly, we contribute to very recent IE literature and theories in the context of the internationalization of born digital firms (Brouthers et al., 2016; Ojala et al., 2018; Monaghan et al., 2020; Glavas et al., 2019) by integrating entrepreneurs' digital capabilities and their international vision and international experience. Although within the IE literature it is widely argued that a consciousness of foreign market opportunities is a result of the entrepreneur's prior international work experience (e.g., Oviatt and McDougall 1994; Johanson and Vahlne, 1977, 1990), and how experientially based competencies developed by entrepreneurs help alleviate liabilities of newness and foreignness (Mudambi and Zahra, 2007), we extend this by demonstrating how the interplay of entrepreneurs' international vision, prior international experience and international experience acquired through the deployment of digital technologies relates to a better understanding to recognize international opportunities. Thus, our research contributes to the IE literature by providing empirical evidence regarding how entrepreneurs interact with digital technologies (e.g., through social media, AI, cloud computing platforms) when undertaking international business activities within their born digital start-up, and how they leverage this knowledge acquired during the international entrepreneurial process. This type of digital international experience is in our theoretical model a key digital capability forming part of our digital capability-building approach.

Thirdly, by integrating insights from the effectuation theories and IOR with Digital Entrepreneurship literature (e.g., Sarasvathy et al., 2014), we expand the effectual decision-making logic to digital entrepreneurial process by developing a theoretical model of international opportunity recognition within a born digital firm. The model shows how an effectual decision-making logic can be more relevant in a digital environment in several ways. Firstly, the disruptive nature of digital technology imposes a high demand of creativity and mindset shifting and the rapidly evolving digital environment calls for continual, frequent effectuation actions from entrepreneurs. Secondly, new digital technologies not only present an opportunity to reconsider businesses' operational processes, but often redefine the conditions of success and rules of competition. Thus, the digital entrepreneur faces increasingly dynamic paths, determined by diverse activities with uncertain time frames (Nambisan, 2017). Thirdly, the variety of possibilities offered by digital technologies also means an increase in the number of possible means in the effectuation process. Thus, our study sheds light on international opportunity recognition unfolding within a born digital firm formation by examining digital entrepreneur's decision-making processes.

6.1 Empirical Implications

This study raises important questions about the relationship between e-entrepreneurs' capabilities and international opportunity recognition, and the impact of effectuation approach that could be relevant to digital start-up firms and their entrepreneurs. First, knowledge is limited concerning how the disruptive nature of digital technology imposes an entrepreneurs' digital start-up mindset, and how an uncertain digital environment calls for continual effectuation actions by e-entrepreneurs. Indeed, this study acknowledges how entrepreneurs with international vision and prior international experience are more global in nature and tend to outperform by seeking out new international business opportunities from the very beginning. However, our study outcome also highlights the entrepreneurs' level of knowledge acquired through the deployment of digital technologies during the initial phases of the company's creation as a key capability at recognizing international opportunities. In this manner, we acknowledge that the interplay of international vision and prior experience with the experientially based digital competences can enable entrepreneurs pursue international opportunities to a variety of markets at low costs and in less time. Such experientially based digital competences acquired by the e-entrepreneurs help alleviate liabilities of newness and foreignness.

Second, we acknowledge that in practice e-entrepreneurs are required to make favourable and knowledgeable decisions to facilitate international opportunity recognition and company performance. Although the entrepreneurs could intend to engage in rational decision-making from the early stages of the companies, the inherent uncertainty present in the digital global market attempt entrepreneurs to exercise control over what can be done with available resources (effectuation rationality) rather than decide what ought to be done given a set of predictions about what happens next (predictive rational view). The present exploration of entrepreneurs' effectual and causal logics and how their choices influence value appropriation makes a promising contribution to the international entrepreneurship research on IOR.

7. Limitations and further research directions

There are several limiting issues to be considered in evaluating our findings. The first limitation of this study is the fact that the findings are based on material involving one company and therefore even if the research method applied makes it possible to collect in-depth data and to gain a detailed view of the case in question, in a single case study method over-generalization should be avoided. Secondly, the observation period concerned only both the pre- and post-establishment periods until the inception of operations. Thus, based on the results of the study, it is not possible to analyze on what happens to the international opportunity recognition processes

once the company has started its new platform commercialization and international market development. Future longitudinal research will be valuable as for how international opportunities develop over time in a digital context. Thirdly, although key decision-makers have been widely viewed as an acceptable representation of the firm, particularly in smaller firms (e.g., Loane et al., 2004), future research may seek to extend data collection to multiple levels of analysis, such as at the level of the firm itself and the management team. This would allow for findings to be validated across levels, potentially shedding further light on the development and transfer of international knowledge and experience for international business activities. Fourthly, our study has been underpinned according to Chandra et al.'s (2009) opportunity recognition definition as a process that consists of both discovery and creation. Therefore, our study has not taken sides in the discussion whether international opportunities are discovered and/or created by digital entrepreneurs inside born digital firms. More empirical research is needed on this topic in a digital context in the IE literature and theory. Finally, our research supports that effectuation logic is the dominant path to decision-making in the key stages of the firm operating in a digital context. However, we call for further multiple case studies to corroborate our findings. Future research would be valuable to evidence if both effectuation and causation logics can actually work simultaneously in the same organization (e.g., Nummela et al., 2014; Evers and Andersson, 2019) in a digital context.

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CHAPTER 4

International Growth of Born Digital Firms: Thoughts on Digital Business Models' Dimensions

Abstract

The relation between digital business models of born digital firms and their internationalization strategies has strong evidence but is not enough explained by International Business (IB) and the International Entrepreneurship (IE) research fields. Besides, the degree to which new digital ventures internationalize is highly heterogeneous, suggesting that a holistic approach of the company might be valuable to identify the key elements of its international growth. For this purpose, the business model theories seem to be a suitable approach for fulfilling the objectives of this study. By looking at born digital firms' business model main characteristics and the current literature around their international growth, we develop a framework to guide future research drawing from a digital business model perspective.

Keywords: Born Digital firms, Digitalization, International Growth, Business Model, Digital Business Model

1. Introduction

International Business (IB) and International Entrepreneurship (IE) research fields have emerged as important areas of investigation for researchers in understanding the role and impact of new digital technologies in the internationalization regarding born digital firms (Brouthers, Geisser, and Rothlauf, 2016; Ojala, Evers, and Rialp, 2018; Vadana, Torkkeli, Kuivalainen, and Saarenketo, 2019; Cahen and Borini, 2020; Monaghan, Tippmann, and Coviello, 2020; Gabrielson, Fraccastoro, Ojala, and Rollins, 2021). Despite in the last two decades researchers have increasingly raised questions regarding the impact of the Internet and digital technologies on the ways that firms operate and create value in international markets, IE and IB research fields

are particularly scarce in identifying and understanding how born digital firms grow internationally.

Besides, among several studies of born digital firms and their internationalization, few scholars recognized that the business model characteristics play a central role in explaining why some digital firms internationalize faster than others. The business model (BM) concept itself is yet a relatively new field of research, and it has since been accepted as an object of interest in Information Systems (IS) research (Osterwalder et al. 2005; Veit et al. 2014). The economic leveraging of these novel technological opportunities in a dynamic and uncertain digital world requires born digital firms to implement adequate BMs, from now on referred to as digital business models (DBMs) (Al-Debi et al. 2008; Chesbrough 2010; Veit et al. 2014). In sum, the BM is a tool to conceptualize the “blueprint how a company does business” (Osterwalder et al. 2005, p. 2).

Some scholars drawing on business models theories, have suggested theoretical frameworks to shed light on born digital firms’ internationalization regarding, for example, the characteristics of platform-ecosystem organizational form (Yonatany, 2017; Stallkamp, et al., 2021). Other scholars provide an assessment of how the widespread adoption of new digital technologies (i.e., the IoT-Internet of Things, big data and analytics, robotic systems, and additive manufacturing) may affect the location and organization of firm’ activities within a global value chain (Strange and Zuchella, 2017). Other authors distinguish two main categories of digital business models, i.e., virtual communities, and marketplaces, grounded in two dimensions, such as interactivity and novelty of the value offering (Brouthers et al., 2016). Other research proposes the three essential components of the business model conceptualization, namely, the value proposition, value creation and delivery infrastructure, and value capture, as a recommendable framework for a differentiation of internationalization strategies among born digital firms (Witkop, Zulaf and Wagner, 2018). A differentiated analysis of born digital firms’ internationalization shows that born digital firms need to be considered as forming a heterogeneous group. For example, Hazarbassanova (2016) proposes that the value creation process of born digital firms causes them to differ from each other, just as much as they differ from traditional firm. Recent research has suggested new theoretical frameworks regarding how value-chain digitalization (upstream and downstream) activities influences the internationalization of companies, providing ways to classify international born-digital and digitalized companies (Vadana, Torkkeli, Kuivalainen, and Saarenketo, 2019). In line with Vadana et al. (2019), other scholars have advanced on the definition and criteria to understand what constitutes a digital entrepreneurial internationalizer (“DEI”) (Gabrielson, et al., 2021) focussing on the entire value chain of the digital firm. In their study, Gabrielson et al. (2021) set up a new theoretical framework to explain the relation between the degree of digitalization of the value chain and the international earliness of digital firms.

Thus, the relation between digital business models' components of born digital firms and their internationalization strategies has strong evidence but is not enough explained by IB and/or the IE theories. Research is still scarce in identifying and understanding how digital business models' components of born digital firms are unfolded in a way to enable these firms to grow internationally. Due to the nascent state of IB and IE research theories on this topic, our theoretical understanding of DBMs and the role played on the born digital firms' internationalization remains underdeveloped.

We begin to address this gap by integrating the literature on BM (Osterwalder et al., 2005; Osterwalder and Pigneur, 2010; Teece, 2010) with DBMs (Chesbrough 2010; Veit et al. 2014), specifically with the literature on digital business models theories and their impact on the born digital firms' internationalization (Brouthers, Geisser, and Rothlauf, 2016; Ojala, Evers, and Rialp, 2018; Vadana, Torkkeli, Kuivalainen, and Saarenketo, 2019; Monaghan, Tippmann, and Coviello, 2020; Gabrielson, Fraccastoro, Ojala, and Rollins, 2021; Mac Cathmhaoil, Evers and Gliga, 2021). Against this backdrop, our study draws on a comprehensive review of the BM and DBM literatures to develop a typology of DBMs' dimensions, which can be used to describe the digital scope of a BM. To illustrate the applicability and usefulness of our study, then we discuss the digital BMs dimensions and their impact on the born digital firms' internationalization. Since the purpose of this research is to identify dimensions that characterize and distinguish digital BMs, we define our sub-constructs of value dimensions and components as the BM elements in which digital technologies play a critical role in creating, delivering, and capturing value (i.e., the digital scope of a BM). By looking at these dimensions' main characteristics and the current literature around the born digital firms' internationalization, we develop a framework to guide future research drawing from a digital business models perspective on born digital firms' international growth.

Accordingly, our study seeks to shed light on DBM dimensions and their impact on the internationalization of born digital firms. We theorize that certain digital business model characteristics play a central role in explaining international growth of born digital firms.

This research makes three main contributions. First, we extend current theorizing on BM by explicitly providing an entire BM definition and conceptualization that could be applied in a digital context. We identify several types of value proposition, several means of value creation and delivery, and several types of value capture among typologies of born digital firms' business models. Second, we integrate DBMs dimensions with the main IE and IB theories on born digital firms' internationalization. This allows us to explain and predict critical aspects of the international strategies of born digital firms. We show that the different components of the DBMs have heterogeneous effects on the international strategies of these firms, Third, we aim to provide

a foundation for future IB and IE research theories to address this increasingly important contemporary phenomenon (Mac Cathmhaoil, Evers and Gliga, 2021).

We will structure this paper in five sections as follows. We first provide a view on business models conceptualizations and digital business models typologies in Information Systems literature. Second, we show how current IB, and IE theories help us to understand international growth of born digital firms. The subsequent section will describe our framework based on the characteristics of DBM that might foster international growth of born digital firms. Finally, we conclude by identifying promising directions for future research that should be explored in order to further understand the relevance of digital business models dimensions to both IB and IE literature.

2. A global perspective on Business Models and Born Digital Firms

2.1. Conceptualizations of Business Models

The concept of “business model” (BM) has come to be widely studied in management disciplines such as strategy, technology innovation, and marketing, and more recently international entrepreneurship (IE) (Onetti et al., 2012; Child et al., 2017). Several definitions have been proposed over the last decade (Shafer et al., 2005; Zott et al., 2011; Clauss, 2017). The term is commonly used to identify how firms do business in order to create value (Demil et al., 2015).

Since the mid 1990s, two main strands of research are identifiable regarding the conceptualization of business models. With the advent of the Internet, a research stream focused on e-business contexts emerged as a matter of new designs and business models. Typical of the e-business literature stream are categorizations and taxonomies of companies operating in the web or e-business sphere. Authors described alternative business models rather than introducing a structured and generally accepted definition of what they mean by the term business model. In the latter part of the 2010s, a more generic stream of research appears assuming a comprehensive approach aimed on identifying business tools which are not necessarily restricted to high-tech. Scholars have been moving to more articulated definitions and identifying building blocks and components. BM discussions in this period were undertaken primarily from a strategy perspective and emphasized consumer specific dimensions of benefit to companies (Teece, 2010). Although some scholars have made efforts to distinguish BM research from business strategy (Shafer et al., 2005), other scholars acknowledge that BMs may embody some strategic elements (Morris et al., 2005; Zott et al., 2011). Some studies portray BMs as strategic blueprints that establish the premises of the organizational structures, processing activities, and implemented systems (Osterwalder and Pigneur, 2010). However, there is an agreement that BMs serve as frameworks

through which firms can implement their strategies (McGrath, 2010), thus providing clarification on how value is created and captured (Osterwalder and Pigneur, 2010; Teece, 2010).

A wide range of definitions have been used in the literature. Different researchers depict BMs graphically, narratively, or as an activity system (Magretta, 2002; Osterwalder and Pigneur, 2010; Zott and Amit, 2007). An example of the most relevant definition from the generic stream of the business model literature is the one coined by Osterwalder et al. (2005): “*A business model can be defined as a framework that allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams*” (Osterwalder et al., 2005: 17–18). Influenced by the Balanced Scorecard approach (Kaplan and Norton 1992), Osterwalder (2005) proposed a framework based on four pillars (product, customer interface, infrastructure management, financial aspects) and nine building blocks (value proposition, target customer, distribution channel, relationship, value configuration, capability, partnership, cost structure and revenue model). In a similar vein, Shafer et al. (2005) analyzed twelve definitions of the business model and built an affinity diagram to categorize the various business model components used in the literature. Shafer and colleagues identified four categories (strategic choices, creating value, capturing value and value network). Zott and Amit (2007) completed their definition by proposing a quantitative research approach to establish the effects of product market strategy and business model choices on firm performance. Zott et al. (2011) argue that the essence of a business model design lies in its “activity system” which is a set of interdependent organizational activities through which human, physical and/or capital resources are brought together to fulfil the firm’s objective.

Another important definition was provided by Teece (2010, p. 179): “*A business model articulates the logic, the data, and other evidence that support a value proposition for the customer and a viable structure of revenues and costs for the enterprise delivering that value. In short, it’s about the benefit the enterprise will deliver to customers, how it will organize to do so, and how it will capture a portion of the value that it delivers.*”

Despite the growing importance of this concept, the literature on BMs is fragmented and heterogeneous. Based on the previous review of literature, it is apparent that while many authors offer definitions of the term business model, definitions are heterogeneous, and none appears to be generally accepted. This definitional ambiguity suggests a need to conceptualize the BM more formally, and to distinguish it from the business strategy, supporting processes and metrics, thus separating and de-layering it from the multi-layer business decision process (Osterwalder et al., 2005).

In our study, we follow the definitions coined by (Osterwalder et al., 2005; Osterwalder and Pigneur, 2010) and Teece (2010), considering that BMs can be broken down into *three key-value dimensions: value proposition, value creation and delivery and value capture* (Teece, 2010; Clauss, 2017).

2.2. Born Digital Firms and Digital Business Models

Despite the number of studies on born digital firms' business models has increase in recent years, research on how digitalization has impacted in the three key-value dimensions of BM, (i.e., value proposition, value creation and delivery, and value capture), is still in its infancy. In the following, we examine the digital business model typologies of born digital firms, referred to here as digital business model (DBM).

First of all, it is important to mention that studies on digital firms published in the last two decades suffer from a lack of clarity in the adoption of definitions of born digital firm. The disjunction between digital and non-digital firms is an understudied complex phenomenon. Recent research (Monaghan et al., 2020) apply the definition point out by UNCTAD (2017) which is based on the fulfilment of three criteria: First, born digital firms are built and leverage on digital infrastructure. Second, born digital firms rely on digital infrastructure to accrue communication, collaboration and/or computing capabilities, capabilities that allow the firm to both create and sell its offering online through a digital business model. Third, born digital firms are digital from inception. Very recent research has advanced on the categorization of born digital firms considering the digitalization affects the value entire chain and the functions in the organization such as marketing, sales, and customer support (Vadana et al., 2020; Gabrielson et al., 2021) in contrast with the definition point out by Monaghan et al. (2020) which is based on that digital firms can categorize as digital on non-digital-based on their trade name. For example, Monaghan's et al. (2020) definition consider the telecom and software firms as non-digital firms since they do not rely on the Internet to fulfill production and delivery activities (Gabrielson et al., 2021). However, several software firms like Adobe (categorized as a non-digital firm by Monaghan et al., 2020) have cloud services (like Adobe Creative Cloud) where software tools and content are available through the Internet.

In this study, to avoid confusion, we may adopt the term "born digital firm" to denote (i) firms whose digital business models are based on digital Information and Communication Technologies (ICTs) (e.g., big data, robotics, artificial intelligence, among others), (ii) the firm's products or services can be marketed and sold by relying on digital infrastructures (the Internet, email, etc.), (iii) the firm's products or services can be delivered by relying on digital infrastructures (the Internet, email, etc.) (iv) these firms are digital from inception, and, (v) these firms provide digital

goods and services. There are many different types of digital goods and services provided through digital firms. Some of the services or goods are purely digital whereas some of the services or goods combine both digital and physical components (Gabrielson et al., 2021). Purely digital goods and services are broadly defined as “experience goods encoded as a string bits” (Mahnke and Venzin, 2003, pg.119): *“the goods do not perish or require transportation; have no diminishing return to scale; have great benefits of economies of scale; might inherit network effects; might produce valuable data”*. Examples of purely born digital firms include digital platforms, providers of digital solutions, and digital content producers/distributors of goods and services in digital format, such as Facebook, Netflix or Spotify. With respect to categories of born digital firms involved in both digital and physical products and services distribution, our study refers basically Internet retailers and e-commerce platforms, such as Amazon and Alibaba.

According to the typology of born digital firms mentioned above, in the following we analyse the Information Systems (IS) literature on digital business models’ characteristics to shed some light on DBM typologies.

As mentioned before, research is scarce on how digitalization has impacted in the three key-value dimensions of BM. Moreover, there are few definitions in the IS literature that attempted to deliver a precise definition of a digital business model. As Veit et al (2014 p.48) define: *“A business model is digital if changes in digital technologies trigger fundamental changes in the way business is carried out and revenues are generated”*. Other scholars define digital business models how a firm creates and captures value through extensive use of digital artifacts (Laudon and Laudon, 2018). Digital artifacts as bits and bytes differ from physical artifacts as they can be characterized as editable, interactive, open/reprogrammable, and distributed (Kallinikos et al. 2013), and they can thus be easily modified and scaled.

According to Hull et al. (2007) digital business models work in a very different way compared to traditional ones. Wind (2008) states that digital businesses represent a “shift from traditional management approaches to ‘network orchestration’” (p. 23), as networks and communities are crucial for digital entrepreneurs. Most of the articles on digital business models dealt directly or indirectly with the emergence of new business models (Krauss et al., 2019). However, the articles have different approaches and furthermore examine different sectors of industry, and typologies.

Regarding studies on sectors of industry, for example, Dutot and Van Horne (2015) analysed digital business models in terms of the appearance of goods and services, digitalization of the distribution channel, digital communication with stakeholders and internal processes carried out on a digital basis. Richter et al. (2017) identify the online sharing economy as a major source of new digital business models. The bases for sharing economy are unused capacities which individuals provide to others in exchange for a benefit, be it a monetary or non-monetary one

(Richter, Kraus and Bouncken, 2015; Richter, Kraus and Syrjä, 2015). Typical examples of this business model are AirBnB and Uber. Ojala (2016) discusses interactive cloud gaming platforms and games on demand services developing a model of how business models are created and developed in markets in which the future directions of a technology are uncertain. Kuester et al. (2018) examines about the latest trend in entrepreneurship concerning service innovation-based business models, and Herrmann et al. (2018) deals with the innovation-driven transformations in the healthcare sector.

With respect to business models' typologies in a digital context, research on IS has evolved by analysing from e-business models to digital platforms and digital ecosystem as a major source to develop innovative digital business models. With the advent of the Internet, many authors trying to describe and understand different e-business models. For example, Timmers (1998) described Internet business models (such as e-shop, e-procurement, 3rd party marketplace, virtual communities, collaboration platforms, value chain service provider) following two classification criteria: functional integration and degree of innovation. Rappa (2000) established a classification the business models on the web (e.g., brokerage model, advertising model, manufacturer model, community model, subscription model, etc.) and Afuah and Tucci (2003) set up an Internet business models' typology based on the dominant revenue model such as commission, advertising, mark-up, subscription, fee-for-service. Later, the specific focus on e-business models lessened, although many of the newer models are still associated with technology as driver or enabler (e.g., Osterwalder and Pigneur, 2010). With the arise of new digital technologies (such as blockchain, cloud computing, or the IoT), born digital firms settled on digital platform businesses such as Google, Facebook, Amazon, Alibaba, and many others, have changed the value dimensions of business models. Bharadwaj et al. (2013) pointed out that during the last decade impressive improvements in information, communication, and connectivity technologies have unleashed new functionalities. Recent research has identified the major elements describing a digital business model, namely, smart products, digital smart services, digitalized processes, ecosystem, platform, and data analytics (Ahmad et al., 2020).

Regarding digital platforms, Göcke and Meier (2021) examine how this type of DBM grow in relevance in nearly every industry by an optimization of transaction costs or a significant increase in innovativeness to create and capture value. Besides, platform business models are characterized by a multi-sidedness of value creation (Gawer 2014). According to Gawer (2014) digital platforms can be classified such as transaction-oriented platforms (e.g., marketplaces), innovation-oriented platforms (e.g., platforms with basic architecture on which different actors come together to create new products and services), and hybrid platforms (e.g., platforms that operate such as a combination of several closely interlinked transaction and innovation platforms). Sussan and Acs (2017) also examine emerging digital business models, which highlight the

sharing and voluntary contributing of users in online platforms as a game changer for transaction cost-based businesses. An example of this type of user-intensive business model are the multisided platforms whereby users provide free content (e.g., Facebook, Instagram).

Remane et al. (2017) distinguish pure digital and digital-enabled business models. Pure digital business models, like Google as a search engine or Airbnb as an online broker, create and capture the value and build their business model on digital artifacts only, without the use of physical assets in their value creation activities. Digital-enabled business models require both physical assets and digital artifacts for the creation of value. Pure digital and digital-enabled business models alike share the characteristics of digital artifacts (Remane et al., 2017).

Other research analyses the categories of digital business models based on the functional aspects of the value proposition (Wirtz, 2019). This author distinguishes four business model categories for Business to Consumer (B2C) businesses, i.e., content commerce, context, and connection (*see Table 1*). The business model category presented in his study might help us to identify the functional aspects of the value proposition of the DBM. For example, the value proposition can be developed on purely digital artifacts (e.g., content business model) or on physical products through a Digital Native Vertical Brand (DNVB) (e.g., commerce business model or vertically integrated consumer retailers that live exclusively on the web without a physical store presence). In the latter case, through a DNVB, the product has become digitalized in the sense that a digital representation of the product has now become generally global. The marketing channel is digital to a certain extent, whereas the product itself is physical. Wirtz (2019) also examines Business to Business (B2B) digital business model whereby companies focus on the business solutions such as the online provision of sourcing, sales, supportive collaboration, and broker services.

Business model category	Business model types	Examples
<i>Content</i> Compilation of content, depiction and provision of content on domestic platform	e-information	wsj.com, handelsblatt.com, Wikipedia
	e-entertainment	partypoker.com, Spotify, WoW
	e-education	udacity, udemy, coursera
	e-infotainment	nba.com, sport1.de
<i>Commerce</i> Initiation and/or settlement of business transactions	e-attraction	AdSense, Shopping.com
	e-bargaining/negotiation	eBay, Groupon
	e-transaction	Paypal, Klarna, Bitcoin
	e-tailing	Amazon, Expedia, book a tiger, zappos.com
<i>Context</i> Classification and systematization of information available on the Internet	Search engines	Google, Yahoo, Bing, DuckDuckGo, Indeed.com
	Web directories	Yahoo.com,
	Book-marking	Citeulike.org
<i>Connection</i> Creation of the possibility to exchange information in networks	Intraconnection (Community)	Facebook, Snapchat, Skype, Flickr, Yelp, Gmail, Dropbox
	Interconnection	earthlink.net, sonic.net, att.com, t-mobile.com

Table 1. Business Models Typologies (reference to Wirtz, 2019)

Research on e-commerce firms states that these companies engaged in electronic commerce from inception (Singh and Kundu, 2002), and with essential turnover derived from online transactions

(Luo, Zhao and Du, 2005). The e-commerce firms are highly differentiated by their main activity (trading, service and production firms), type of products offered (digital or tangible goods and services) to diverse customers, representing various e-business models such as e-stores or international intermediary platforms (e.g., Alibaba, Amazon, Rakuten, eBay), having a different size, managed by the owner (entrepreneurial or family firms) or by professional managers. The e-commerce platforms (business-to-business, business to consumer or consumer to consumer platforms) allow firms and users to interact and buy and sell products online (Li, Su, Zhang, and Mao, 2018).

Brouthers et al. (2016) depict a typology of digital business model based on two dimensions, namely, the novelty of the value offering and the interactivity between users, identifying two typologies of business models that fall under their definition: virtual communities and marketplaces.

In sum, continuing digitalization and its impact on business models lead to various streams of literature that emerge parallelly and provide different typologies of digital business models (DBMs). Furthermore, it results in synonymously used terminology and concepts what leads to a lack of clarity. To avoid confusion, our study follows DBM conceptualization as Veit et al (2014) state.

Further research, therefore, needs to find a consensus of the Information Systems literature in order to provide a unifying understanding of DBMs and its adjacent concepts.

3. How do current IB and IE theories explain Born Digital Firms' internationalization?

3.1. Born Digital Firms' International Growth

The use of advanced digital ICT allows companies to identify opportunities for improvement, provide challenges to growth and share international activities. Digitalization is transforming how International Business (IB) is conducted (Coviello, Kano and Liesch, 2017; Alcácer, Cantwell and Piscitello, 2016; Vahlne and Johanson, 2017). Digitalization enables some firms to reach high levels of internationalization very rapidly and with limited investment in foreign assets (Eden, 2016; UNCTAD, 2017).

Extant International Business (IB) and International Entrepreneurship (IE) research on digital firms has applied two broad types of internationalizations process theories: the Uppsala model, as well as the more recent theory on International New Ventures (INVs) and born global firms.

The recent literature suggests that digital firms tend to be INVs or born-global firms (Autio et al., 2017; Brouthers et al., 2016), because their products are “instantly accessible from anywhere in the world” (Brouthers et al., 2016, pg. 514). Digital firms are thought to pursue primarily ‘virtual’ internationalization, i.e., without establishing a physical presence in foreign markets (Singh and Kundu, 2002; Yamin and Sinkovics, 2006). Compared to traditional modes of foreign market entry, virtual internationalization greatly reduces the cost and risk of expanding (Autio and Zander, 2016). Digital products and services can easily be exported to remote markets because the Internet permits nearly costless and instantaneous delivery (Hennart, 2014; Mahnke and Venzin, 2003). When value-adding activities need to be performed in foreign markets, digital ICTs often allow firms to externalize these operations by improving communication and monitoring (Autio and Zander, 2016). Scholars have argued that these factors substantially reduce the need for market-seeking foreign direct investment (FDI) (Eden, 2016; UNCTAD, 2017).

Born digital firms also face pull-factors favouring rapid and extensive internationalization. The scalability and low marginal costs associated with digital goods and services create a strong incentive to serve a larger market, to reap economies of scale (Forsgren and Hagström, 2007; Parente, Geleilate and Rong, 2018). Some studies argue that the behaviour of born digital firms might deviate considerably from what the Uppsala model predicts (Forsgren and Hagström, 2007).

However, other studies indicate that born digital firms follow different patterns of internationalization of INVs, and do not necessarily serve foreign markets from inception. Some studies propose that born digital firms are not immune to differences between countries in terms of cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede virtual internationalization (Shaheer and Li, 2020).

Several articles have reviewed the IB and IE research fields treating the sub-field of speed of internationalization and entry modes through digital technologies specifically.

Regarding speed of internationalization, some studies suggest that born digital companies are internationalized soon after their outset, which means that the speed of time to first entry is fast (Monaghan et al., 2020). This behaviour is supported by the born global theory internationalization (Oviatt and McDougall, 2005), and other studies on digital-based international new ventures (Ojala, Evers, and Rialp, 2018), that extend the scope of INV theories where firms internationalize proactively and rapidly after inception.

A driver behind the swift international expansion among born digital firms is the rapid speed and competition in the sector. It is generally stressed, and there is an underlying assumption in the industry, that first-mover advantage is crucial. Chen, Shaheer, Yi, and Li (2019) refer to this as the phenomenon of “winner takes it all”. The online industry is characterized by a pattern in which

leading firms capture a disproportionate share of the market during a short time span via network effects, and this puts pressure on competing firms to engage in rapid internationalization. Additionally, in the case of digital innovations such as web and mobile applications, Shaheer and Li (2020) argue entry barriers may not impede offering their digital products/services. These firms can join globally accessible online platforms that internalize many barriers to internationalization, such as the presence into foreign markets, payment mechanisms, and trust between businesses and users (Autio et al., 2017; Nambisan, 2017). Affiliation with such platforms grants purely digital products/services global accessibility from inception with little or no barriers to entering foreign markets.

This is also evident in terms of "sequencing" or, in other words, the pace of subsequent market entries: the firms keep a high pace going in the early phase of internationalization. Online consumer mobility means that companies are pushed to act fast to attain a critical mass of customers and manage the competition, leading to compressed sequencing (Brouthers, et al., 2016).

However, research has shed light into some critical factors that affecting the rapid pace of internationalization. In this sense, Wentrup (2016) emphasizes the balance in the internationalization process between an online and offline presence ("online-offline interval"). There seems to be a limit on how long a born digital firm can operate fully online without needing a physical presence. His study reveals the importance of home markets as a springboard, and of regional expansion in the early phase of internationalization. In addition, low entry barriers for online entry must be considered in relation to barriers in the offline context (e.g., legal compliance and market-specific requirements). In the case of digital platforms, other studies indicate that the early internationalization and subsequent foreign market entries are governed by layered modular architecture, (Ojala, Evers, and Rialp, 2018), and its dependent on the platform provider's capability to replicate a workable architecture stack in a target country. Therefore, main barriers faced by platform companies in their internationalization endeavours are the weaknesses of local technological infrastructure, the lack of complementary asset providers, and local regulations (Parente et al., 2018).

Regarding born digital firms based on web and mobile applications, there are some salient factors affecting the internationalization speed. Although these typology of born digital firms are globally available via online platforms, their international penetration is still subject to cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede firm' internationalization. These companies may overcome these barriers by employing the demand-side strategies of engaging users in value co-creation (Shaheer and Li, 2020). In this

sense, the CAGE distances in cyberspace may act as “user adoption barriers”, instead of market entry barriers.

According to studies on entry modes by born digital firms, research has investigated how born digital firms seek to enter foreign markets through entry modes that allow control in branding and advertising strategies, because of the “experience character of digital goods” (Mahnke and Venzin, 2003). Thus, entry modes may be chosen to seek control regarding possibilities of customer education rather than overcoming the hazards of liabilities of foreignness, consider as a bilateral factor. Other scholars argue that born digital firms prefer to enter international markets via controlled modes (e.g., subsidiaries) (Wentrup, 2016). This is due to a network effect as well as the nature of online service itself, with a technical complexity.

However, some born digital firms are more likely to assume that online interactions generate insights not only on buyer behaviour and preferences, but also about the underlying market conditions that shape customer preferences and behaviour. The possibility of a “virtuality trap” is stronger in the case of digitalised products compare to non-digitalised products (Yamin and Sinkovics, 2006). By virtuality trap, these authors mean a perception by the internationalising firms that the learning generated through virtual interactions obviates the need for learning about the target market. Thus, digital internationalization is likely to engender a perception of reduced psychic distance. Due to the cost of transferring from one country to another are relatively small, born digital firms will be influenced to a lesser extent by investment risks related to Liabilities of Foreignness (LoF) (Johanson and Vahlne, 2009). In contrast, digital firms should deal with greater Liabilities of Outsidership (LoO), since the main concern is the creation of a large enough network of users to generate value on its platform and create thick ecosystems in new countries (Brouthers et al., 2016). Such research would also require a clearer understanding of related factors such as the role of networks and ecosystems.

There seems to be significant heterogeneity in the extent to which born digital firms achieve global reach (Mahnke and Venzin, 2003; Bell and Loane, 2010; Chen, Shareer, Yi, and Li, 2019). Besides, there is little empirical evidence on whether born digital firms internationalize faster or slower than non-digital firms, and the underlying drivers of why some born digital ventures internationalize faster than others.

3.2. Digital Business Model theories on Born Digital Firms’ Internationalization

Drawing on Business Models theories, prior research has made many efforts to integrate the international entrepreneurship approach with the strategic management searching for systemic

approach of management. This approach reflects the holistic nature of the growth processes that characterize young new technology-based firms, whereby entrepreneurship, innovation and internationalization are deeply inter-connected (Onetti, Zuchella, Jones, and McDougall-Covin, 2012). In their study, Onetti et al. (2012) made a clear distinction between the business model and the strategy concepts and highlighted the relevance of location decisions, not considered by extant business model literature at that date, which is particularly important for entrepreneurial start-ups, operating in complex environments and facing the challenges/opportunities of global markets and cross-boundary relationships. Following Zott and Amit (2007), the business model design and implementation is vital to effective strategic entrepreneurial management. The business model represents a relatively formal illustration of how a firm integrates its core activities with location and modality, drawn together by its strategic and operational intentions. Indeed, previous research on business models has stimulated new reflections on the mechanisms and factors that drive digital firms to engage and enhance their innovations outcomes and processes to internationalize.

A recent emerging theme pertains to impact of Business Models components on born digital firms' internationalization. This new-born research stream has suggested new theoretical frameworks on key-value dimensions of born digital ventures' business models to internationalize (Brouthers, et al., 2016; Hazarbassanova, 2016; Yonatany, 2017; Strange and Zuchella, 2017; Witkop, et al., 2018; Hänninen, et al., 2017; Vadana, et al., 2019; Gabrielson, et al., 2021; Mac Cathmhaoil, et al., 2021).

The impacts of value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), the specific way of creating value and the individual customer interface used by a digital business play key roles in digital internationalization. On this theoretical basis provided, it is possible to develop a comprehensive understanding of how born digital companies are internationalizing and why their internationalization processes differ from each other attending their business model components. Digitalization impacts on the business model as technologies enable new ways of value creation and customer relationships. Exemplary is the customer segmentation based on interest-based factors, which is enabled by the analysis of big data derived from social networks (Hänninen, Smedlund and Mitronen, 2017). Born digital companies often do not conduct market research before starting their international expansion. The costs and the risk of failure have decreased due to digitalization so that the advantage of trying to enter the market is considered superior compared with a long, costly, and incremental market entry (Autio and Zander, 2016). In this sense, the business model concept can help provide a structure to the large number of variables in the IB and IE theories. A differentiation in the value proposition, value creation and delivery, and value capture is recommendable as a framework for a differentiation of internationalization strategies among different types of born digital firms (Witkop, Zulaf and Wagner, 2018). A differentiated analysis of digital firm's internationalization

shows that born digital firms need to be considered as forming a heterogeneous group. Hazarbassanova (2016) proposes that the value creation process of born digital firms causes them to differ from each other, just as much as they differ from traditional firm. The relation of the value proposition to internationalization strategies has strong evidence but is not explained by IB or the IE theories. It has been confirmed that both the customer interface and the value creation logic are relevant variables. The value creation and delivery method are reflected in many of the traditional internationalization theories and remains crucial (Hazarbassanova, 2016). The value capture dimension (revenue model and financial aspects) is found to be less determining, as it itself is a determinant of the first two business model's components (Witkop, Zulaf and Wagner, 2018). König et al. (2019) analyse different patterns in the evolution of digital and non-digital ventures business models through the early stages of the business cycle. Digital ventures focus initially on developing transactions with their customers before searching investments in contrast with non-digital, that require investments beforehand to build capital-intensive assets for value creation.

Strange and Zuchella (2017) provide an assessment of how the widespread adoption of new digital technologies (i.e. the IoT-Internet of Things, big data and analytics, robotic systems and additive manufacturing) may affect the location and organization of firm's activities within global value chain. Global Value Chain concept particularly is referring to adoption and impact of the new digital technologies (commonly known as Industry 4.0).

Recent research has suggested new theoretical frameworks regarding how value-chain digitalization (upstream and downstream) activities (i.e., creating and producing, marketing and sales, and customer service) influences the internationalization of born digital companies (Vadana, et al., 2019), and how these companies overcome or enhance their limits (e.g., capabilities, budget) by assembling their internationalization strategies with various available online-offline elements, such as digital technologies, organizational marketing activities, and networks.

In line with Vadana et al. (2019), other scholars have advanced on the definition and criteria to understand what constitutes a digital entrepreneurial internationalizer ("DEI") (Gabrielson, et al., 2021) focussing on the entire value chain of the digital firm. In their study, Gabrielson et al. (2021) set up a new theoretical framework to explain the relation between the degree of digitalization of the value chain and the international earliness of digital firms. Their study points out that it is necessary to distinguish and clearly define different typologies of firms approaching international markets and deploying digitalization in some or many of their business functions for a better understanding of their international earliness.

In a very recent study, Mac Cathmhaoil, Evers and Gliga (2021) explore how effective the global business model components are at explaining the growth trajectory of “born global digital firms” and the major strategic changes. The global business model framework proposed by these authors (adapted from Evers et al., 2014) is grounded on several elements which have enabled born digital companies to operate and grow internationally: value proposition, international target customers, psychographic and behavioural segmentation, international sales channels, global scope of product and activities, revenue models, value networks (partnerships), international assets (i.e., brand, intellectual property, and resources), and data analytics. The globalise framework of business model proposed by these authors is depicted in Figure 1.

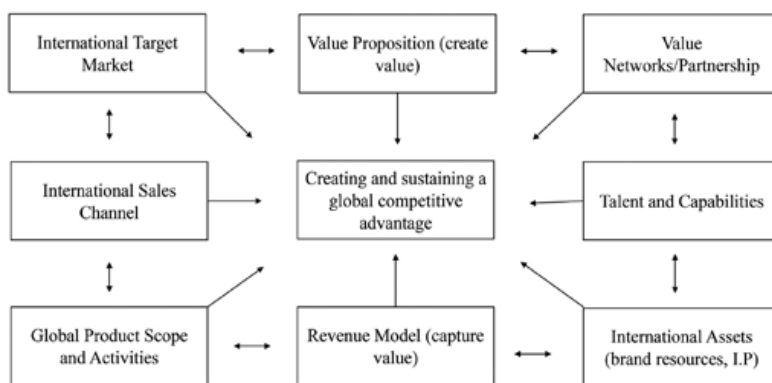


Figure 1: Source Mac Cathmhaoil, Evers and Gliga (2021). Globalising the business model

In IE literature, the concept of a global business model is based on uniformity of the firm’s value proposition and value-creating and value-capturing mechanisms across country markets (Tallman, Luo, and Buckley, 2018). Uniformity embodies the non-location-bound firm-specific advantages that facilitates replication, by minimizing the time and resources required for local adjustments (Reuber et al., 2021). Consequently, a global business model reduces the costs and friction of entering foreign markets, thus enabling global scaling. In their study, Reuber et al. (2021) highlight both the internal and external facilitators of rapid international growth to the firm and replication facet to global scaling. An example of these facilitators is both digital products and processes inasmuch as they can be replicated quickly and cheaply (Autio, Mudambi, and Yoo, 2021; Monaghan, Tippmann, and Coviello, 2020).

Based on the review of previous literature, it is quite evident that research has advanced the understanding of born digital firms’ internationalization (Monaghan, et al., 2020) by merging concepts from IE, IB and IS literatures. However, the existing literature does not extract a complete picture of how the liability of being especially young and inexperienced and, with access

to limited resources influences the international growth of born digital companies through the deployment of three key-value dimensions of DBM.

Moreover, as mentioned above, born digital firms need to be considered as forming a heterogeneous group (Hazarbassanova, 2016). It is crucial to take into account the different typologies of digital firms (Gabrielson, et al., 2021) for a deeper explanation of the international growth followed by these firms.

In summary, born digital firms follow different ways to internationalize by using several elements of their business model which enable these firms to operate and grow internationally (Brouthers, et al., 2016; Hazarbassanova, 2016; Yonatany, 2017; Strange and Zuchella, 2017; Witkop, et al., 2018; Hänninen, et al., 2017; Vadana, et al., 2019; Gabrielson, et al., 2021; Mac Cathmhaoil, et al., 2021).

In the following section, we discuss the digital business model theories as an approach that can create a conceptual framework providing insights into the mechanics of born digital firms' business model and their international growth.

4. A Framework of DBMs and BDFs' Internationalization

Consistent with Osterwalder et al. (2005), Osterwalder and Pigneur (2010) and Teece (2010), our study is grounded on the three key-value dimensions that BMs can be broken-down: value proposition, value creation and delivery and value capture (Teece, 2010; Clauss, 2017). Figure 2 represents the Business Model Canvas provided by Osterwalder and Pigneur (2010) as a framework of nine items organized under three key-value dimensions, on which our conceptual framework is developed.

Besides, our study grounded on the assumption that the value dimensions of a BM are interdependent, that is, the combination of the three value mechanisms forms the globality of a firm's BM (Shafer et al., 2005; Clauss, 2017). It is important to recognize that a business model framework "*more than the sum of its parts, the model captures the essence of how the business system will be focused*" (Morris et al., 2005, p. 727).

Value is a central and independent construct, focused on the firm (Zott and Amit, 2007), describing the attributes (qualities, characteristics, and dynamics) at the focal-firm level and the boundary-spanning activities that the firm undertakes.

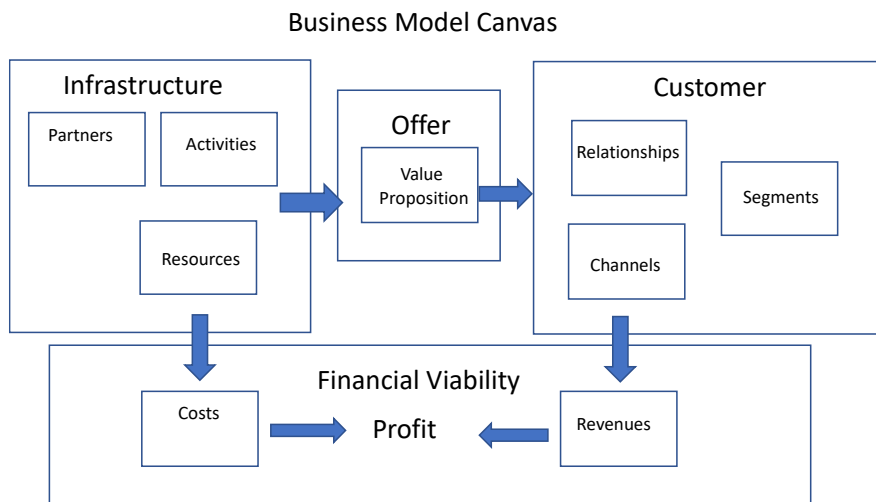


Figure 2. Business Model Canvas. Source: Osterwalder and Pigneur, 2010

Value proposition: This concept is a key element of the BM and generally refers to the reasons a customer will value a firm's (proposed) offering (Johnson et al., 2008; Osterwalder and Pigneur, 2010). It also explicitly includes the intended customer or target market. As Richardson (2005) pointed out "*It seems imprudent to talk about the value of an offering without talking about to whom*" (Richardson, 2005, p. 13). Therefore, value proposition is customer-centric and deals with how the firm provides different offerings or solutions for its customers and stakeholders (Morris et al., 2005; Teece, 2010). The elements of the value proposition include the offering or what the firm provides to customers, and it also represents the value the firm will offer to a customer relative to the competition (Richardson, 2005). Therefore, the strength of the firm's value proposition also rests on its strategic positioning. Firms can create unique and differentiated value for their customers through their value propositions and thereby achieve lock-in (Kim and Mauborgne, 1998).

Value creation and delivery: Value creation demonstrates how companies produce value for customers along the value chain (Amit and Zott, 2012; Achtenhagen et al., 2013; Clauss, 2017). The value creation explains the architecture of processes, which allow a business to generate better value more efficiently than its competitors do. In addition to the internal sources of competitive advantage, resources, and capabilities, the value creation construct contains the structure of a company's external links, including suppliers, distributors, and collaborators (Richardson, 2005). Thus, value creation combines interdependent activities that can add value to company products and services. The value creation dimension of a BM reflects the organizational decisions that define resource allocation and the identification of and capitalization on new business opportunities, as well as the introduction of new products and services to the market (Teece, 2010). Thus, the (latent or realized) value created should consider customer satisfaction and how successfully the firm can meet customer needs. Value delivery describes the way the

activities and processes in a company are employed to deliver the promised value to the customer. Value delivery requires that a company has the competencies to evaluate and employ the best channel to deliver the value proposition at cost-efficient prices. Customer relationships are one of the most important parts of this dimension because they can be established or changed through interaction and customer relationship management (Osterwalder and Pigneur, 2010; Clauss, 2017). Thus, value delivery concerns the channels through which companies reach their key customer segments (Osterwalder and Pigneur, 2010; Baden-Fuller and Mangematin, 2013).

Value capture: This concept assumes that if a company delivers value (a good, a service, or a solution), customers who appreciate that value will be willing to pay for it (Teece, 2010). Thus, the value capture of the BM involves the revenue model and its financial viability by focusing on revenue streams and cost structures (Osterwalder and Pigneur, 2010). Other factors that are considered in value capture include price.

Researchers have come up with different definitions in an attempt to explain what the essence and purpose of a business model is (Pateli and Giaglis, 2005). Definitions have had different foci and have been more and less inclusive, and therefore, it will be important for the definition to provide a generic and abstract conceptualization that can be applied for different purposes and in different contexts (e.g., technology, innovation, strategy) (Fielt, 2013).

Accordingly, our study is grounded on definitions of BM formulated around the value logic in terms of creating, delivering and/or capturing value (e.g., Chesbrough, 2006; Johnson, 2008; Osterwalder and Pigneur, 2010; Teece, 2010). Thus, our study provides an entire BM definition and conceptualization that could be applied in a digital context, as we analyze in the following.

We first identify sub-constructs of value dimensions and components as the BM elements in which digital technologies play a critical role in creating, delivering, and capturing value (i.e., the digital scope of a BM). By looking at these dimensions' main characteristics and the current literature around the born digital firms' internationalization, we further develop a framework to guide future research drawing from a digital business model perspective in the born digital firms' international growth.

Regarding the international growth concept, our study is grounded on early and accelerated internationalization as the IE literature has conceptualized (e.g., Knight and Cavusgil, 2004; Oviatt and McDougall, 1994). The early internationalization literature measures the rapidity of international growth by the speed with which a firm attains a threshold level of sales in foreign markets within a certain time after start-up. Next, we theorize that certain DBM's characteristics play a central role in explaining born digital firms' rapid growth across foreign markets.

This study conceptualizes the DBM by including the nine components of Business Model Canvas presented by Osterwalder et al. (2005) and Osterwalder and Pigneur (2010) to facilitate the analysis of the sub-constructs of value dimensions and components of DBMs. Table 2 provides an outline of the DBMs' dimensions adopted in this study.

Nine Business Model Building Block (Osterwalder et al., 2005) Osterwalder and Pigneur (2010)	Dimensions of Digital Business Model (DBM)	Sub-constructs of value dimensions in Digital Context	Components
<i>Value Proposition</i> : gives an overall view of a company's bundle of products and services.	Value Proposition	Digital Offerings	Digital products and services: novelty (efficiency, complementarities, and lock-in effects) and value co-creation
<i>Target Customer/markets</i> : describes the segments of customers a company wants to offer value to.		Segments of customers and markets	Target customers and markets: segments, niche, markets (international and domestic), positioning, market presence (e.g., data analytics: personalization, engagement, and community building)
<i>Value Configuration</i> : describes the arrangement of activities and resources.	Value Creation and Delivery	Digital organization	Internal and external organizational processes and structures, norms, production: digital ecosystem integration; scalability
<i>Partner Network</i> : portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value.		Value Networks and Key Partnerships	Value chain, suppliers, networks (e.g., virtual communities; marketplaces)
<i>Core Competency</i> : outlines the competencies necessary to execute the company's business model.		Digital Capabilities	Digital technologies (e.g., Artificial intelligence, Big Data, Robotics), equipment, intellectual property, assets, people (digital mind-set)
<i>Distribution Channel</i> : describes the various means of the company to get in touch with its customers.		Virtual channels	Access (e.g., web-based app; platforms), interactivity (e.g., B2C, B2B, C2C) and online communication
<i>Relationships</i> : explains the kind of links a company establishes between itself and its different customer segments.		Customer relationships	Customer support, customer acquisition and retention
<i>Cost Structure</i> : sums up the monetary consequences of the means employed in the business model.	Value Capture	Cost structure	Costs (fixed and variable), estimation, margins, economies of scale, and scope
<i>Revenue Model</i> : describes the way a company makes money through a variety of revenue flows.		Revenue model	Pricing, monetization, estimation of profit formula (e.g., Subscription- base, Freemium)

Table 2. Dimensions and Sub-constructs of Digital Business Model (DBM)

DBMs' Value proposition. This dimension is in our framework viewed as the value received by the customers (Richardson, 2005) and a core component of the business model as the “proposition, which is accepted, rejected or unnoticed by the customers” (Shafer et al. 2005, Vargo et al. 2008). Therefore, our digital value proposition' definition is based on a “customer-centric” concept. The sub-constructs and components adopted in our definition are the product or service offered, and it also explicitly includes the target customers/markets.

Digital Offerings

Digital offerings can be described along five distinct characteristics: digital products, digital services, human services with complementary digital services, physical products with complementary digital services, as well as physical products with embedded digital technologies (Wirtz et al., 2010).

Digitalization enables firms to understand customer needs better and offer new value propositions in accordance with what they want. The novelty of the born digital firms' offerings is leading to a unique value proposition. Novelty is based on three elements: efficiency, complementarities, or lock-in effects (Amit and Zott, 2001; Dubosson-Torbay, Osterwalder, and Pigneur, 2002). Born digital firms have high novelty as they use digital technologies in their business model making it possible to provide these three elements to their users (Brouthers et. al, 2016). For instance, innovative value propositions can provide a high level of involvement for the customers in value co-creation such as smart apps, drones, 3D printing (Troxler and Wolf, 2017). Other representative example of born digital firms in value co-creation between users is the sharing platforms like Airbnb, Booking.com, car-sharing services and mobile applications (Richter et al., 2017). In line with Brouthers et al. (2016), we suggest that these firms could take full advantage of the value co-creation benefits of digital technologies to grow internationally, for example, by providing a platform for fully interactive multilateral communication between their users (e.g., virtual communities).

Segments of customers/markets

Born digital firms can address the value proposition to new customer demand and establishing new forms of customer engagement (Hartmann et al., 2016). Segmentation techniques based on activities, interests, and opinions dimensions (i.e., psychographic segmentation), may assist born digital firms in identifying behavioural-based profiles of their customers (Kotler et al., 2017). Profiling customers' tastes, interest, and behaviour, regardless of their location and demographics, can thus enable these companies to target customers and to personalise and tailor the value proposition much more accurately (Kalyanaraman and Sundar, 2006). Data-analytics (e.g., Big Data) is, therefore, a key characteristic of DBM which allows to extract and identify correlations and patterns regarding target customers and markets information. Thus, in-depth knowledge of target customers and markets allows born digital companies to create an offer well-suited to their customers' behaviour by developing their products and services based on personalization, commitment, and community building (Weill and Worner, 2013).

In line with Mac Cathmhaoil, Evers and Gliga (2021), we suggest that such psychographic and behavioural segmentation enables born digital companies to operate and grow internationally.

DBMs' Value creation and delivery. Both the value creation and delivery of DBM are in our framework grounded on the key activities, the key partners, and key resources of the business model. The sub-constructs and components adopted in our study are the following:

Digital Organization

Digital organization refers to internal and external organizational processes and structures, norms, and production. This sub-construct also reflects the organizational decisions that define resource allocation and the identification of and capitalization on new business opportunities, as well as the introduction of new products and services to the market (Teece, 2010).

One of the ways to create value by born digital firms is to develop their business model through digital platforms and digital ecosystem (Srinivasan and Venkatraman, 2018). According to Li et al. (as cited in Sussan and Acs, 2017, p. 58), a digital ecosystem is “*a self-organizing, scalable and sustainable system composed of heterogeneous digital entities and their interrelations focusing on interactions among entities to increase system utility, gain benefits, and promote information sharing, inner and inter cooperation and system innovation*”. Sussan and Acs (2017) identify the ability to connect customers of different groups with each other at vastly decreasing transaction costs as the core competence of recent successful ventures. Indeed, a digital ecosystem is the connection of people, processes, companies, data, and things that share the use of digital platforms. It induces tremendous network effects, namely, support of users, participants adopting a provided technology, interactions, and feedback from the digital Society (Kraus et al., 2019). Therefore, based on digital ecosystems and digital platforms, born digital firms can scale their business by incorporating, for example, new added value services/products (Autio et al., 2017).

Besides, some scholars highlight the importance of acknowledging business ecosystems across nations to foster born digital firms' international growth (Parente et al., 2018), specifically in C2C digital firms. Ecosystems are seen as open communities comprising different actors such as direct suppliers, complementors, regulatory authorities, the judiciary system, and research institutions (Teece, 2010) that have different roles in the value creation and capture process. We suggest that born digital firms would benefit from intensifying and extending internationalization activities by scaling their organization globally on digital ecosystems.

Value Networks and Key Partnerships

Networking capabilities is another critical characteristic of DBM by fostering the business process in domestic and international markets (Brouthers et al., 2016; Mac Cathmhaoil, Evers and Gliga

,2021). The strategic partnerships have a critical influence in the strategic direction, for example, to diversify products or services, enter new industries and leverage international growth (Daaboul et al., 2014).

Social and personal networks are also a useful avenue through which the companies may seek to facilitate international expansion. We suggest that born digital firms may leverage their networking capability and strategic relationships to speed up their initial international activities.

Digital Capabilities

This component refers to e-entrepreneurs' digital capabilities. Some scholars have focused on which specific capabilities contribute to the success of digital start-ups (Zaheer, Breyer, Dumay and, Enjeti, 2018; Dillon et al., 2020). Zaheer et al. (2018) argue that the entrepreneurial attitude combined with a deep understanding of the scalable, open, born-global, generative nature of digital technologies are the elements of a "digital start-up mindset" necessary to set a trajectory and the actions for achieving early success in digital ventures. In fact, claims about the uniqueness of digital start-ups imply that the emergence of digital products/services requires a re-conceptualisation of human and social capital, organisations, ecosystems, and human behaviour in the start-up development process as "informed by the digital technology-perspective" (Nambisan, 2017).

Other scholars highlight the positive impact of digital technology for international entrepreneurs engaging in international business activity but do not delineate between the categories of digital technologies or how they may have a different impact on international business activity through experiences (Glavas et al., 2017; Reuber and Fischer, 2011). Very recently, Dillon et al. (2020) have identified a new type of experience, named "digital internationalisation experience" as a type of experience encompassing both technical and international dimensions of business knowledge. Their study posits how this "digital international experience" enhances opportunity recognition within the context of digital internationalisation. In line with Dillon et al. (2020), we suggest that this type of experience, jointly with a deep knowledge of digital technologies (e.g., AI, Big Data, Robotics), contributes to enhance idea generation and opportunity international recognition by e-entrepreneurs.

Virtual Channels and Customer Relationships

Both virtual channels and customer relationships are the components of value delivery dimension of DBMs. Virtual channels refer to how digital products and services of born digital firms are

accessed through digital technologies, such as web-based applications or digital platforms, to be downloaded across multiple devices. Virtual channels are also referring to interactivity between several business segments (e.g., B2B, B2C, C2C). As mentioned before, customer relationships are one of the most important parts of this dimension because they can be established or changed through interaction and customer relationship management (Osterwalder and Pigneur, 2010; Clauss, 2017).

As Brouthers et al. (2016) point out, the success of a born digital firm lies in its ability to encourage mass-market adoption and build a large user network. In this context, the diffusion of the novelty of its offerings through communication channels such as online social networks, plays a central role in explaining international growth of born digital firms. Besides, online social networks are an important element to reduce uncertainty and enhance differentiation (Fisher and Reuber, 2014).

DBMs' Value Capture. The value capture refers to revenue streams and includes how a firm makes money, or how the value that a firm offers to its end-users or network partners can generate financial revenue (Osterwalder and Pigneur, 2010; Teece, 2010; Zott et al., 2011). In Born digital with purely digital products and services revenues coming from direct or indirect monetization of data. An intensive exchange of data between companies and customers, as well as among companies, opens up opportunities for generating new revenue streams by selling this data to partners, either directly or after some enrichment by intelligent data aggregation services. It is common in born digital firms the multiple revenue stream approach. The revenue stream of digital business model involves hidden revenue generation model (such as charging advertisers for contextual advertising and receiving sponsorship and revenue-sharing fees from partnerships with retail chains), e-commerce model, “freemium” (free and premium) model, and subscription-based model (Teece, 2010).

The value capture component also clarifies the financial structure of the business in the economic model (Osterwalder et al., 2005). Born digital firms with purely digital offering can optimized cost structure since digital content has a low marginal cost for reproduction and delivery.

The value capture dimension of the DBM is essential because a sound value proposition and a highly efficient value creation and delivery infrastructure are not sufficient for maintaining a profitable business in a sustainable way. In the digital environment, consumers can pose challenges to digital companies if the expectation of getting a free offer is not provided (Teece, 2010).

One of the challenges for born digital firms is the business' monetization from early stages of their development. Many of these digital businesses run at a loss for many years (Mac Cathmhaoil,

Evers and Gliga, 2021; Stallkamp et al., 2022) confronting themselves what Gebauer et al. (2020 p. 314) refer to as a “digitalization paradox,” in which value-generation is expedited through digitalization, but value-capture through revenue generation is elusive. These insights might indicate that born digital firms’ revenue model is a key area, strategically used for international growth and increased competitiveness.

In sum, digitalization is enabling born digital firms to create new value in a diversity of ways to offer an innovative value proposition, as well as new ways to earn revenues (i.e., capture value) from the provision of information to users/customers (Teece, 2010). Hence, business models’ value dimensions may help these companies to find international market opportunities based on the digitalization of their components.

Based on the discussion above, we build the conceptual framework highlighting digital business model’ characteristics that might play a central role in explaining international growth of born digital firms (see Figure 3).

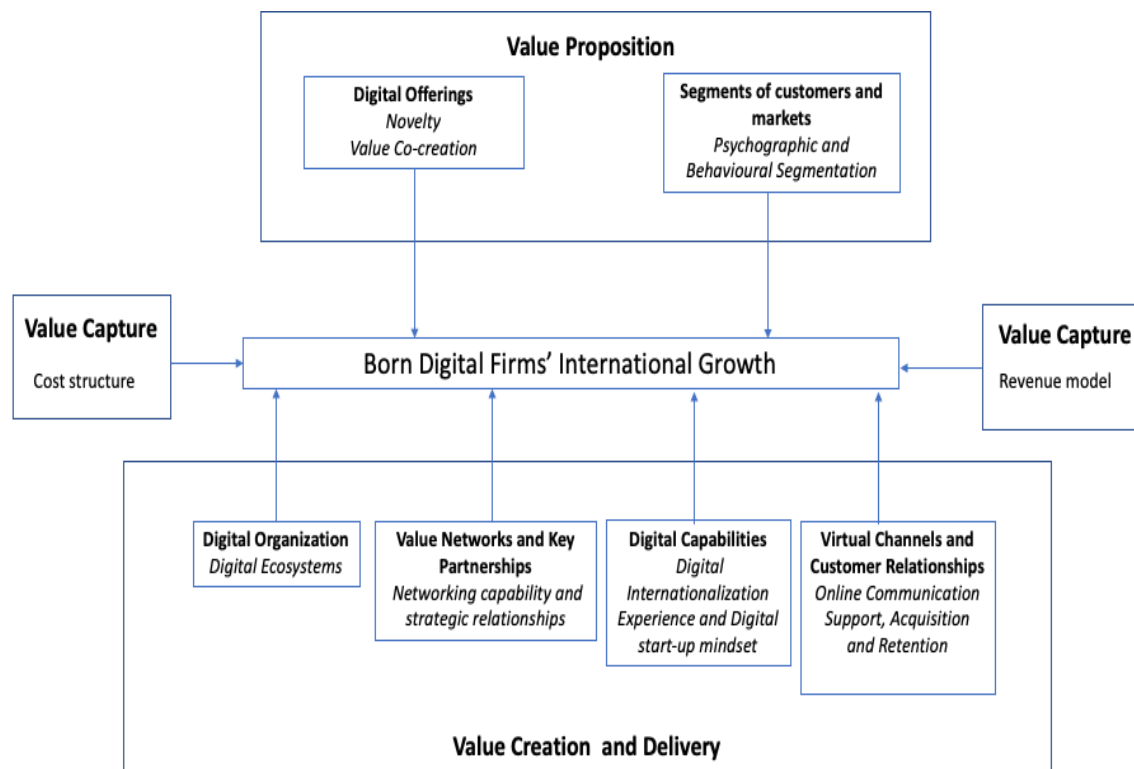


Figure 3. Digital Business Models Main Characteristics on Born Digital Firms’ International Growth

5. Conclusion and Future Research Agenda

The aim of this study is to advance knowledge of how business modelling (Teece, 2010; Osterwalder and Pigneur, 2010) can be used in born digital firms, and to further identify the mechanisms that such companies employ to create and sustain their international growth. The contribution of this study is that it extends the business model canvas to born digital firms and modifies certain components to reflect the specifics of digital business model' dimensions.

Next, we present the conclusions and highlight the importance of investigating the impact of DBMs' dimensions in the born digital firms' international growth and point out avenues of future research that are relevant for both theory and practice.

Our discussion indicates that born digital firms' BM have key features that might foster their international growth and increased competitiveness. Our analysis reveals the importance that value proposition places on born digital firms' internationalization since the main characteristic is to empower customers/users by offering smart products and services (novelty) with efficiency, complementarities, lock-in effects, and co-creating value in virtual communities (Brouthers et al., 2016). The behavioural customer/market segmentation is also key component of DBMs' value proposition in our study, since these firms can generate very specific demands, addressing their digital products/services to customers on a global scale (Mac Cathmhaoil, Evers and Gliga, 2021). Further understanding of how born digital firms develop competitive advantages based on their value propositions in foreign countries is necessary. As we highlighted, born digital firms may face issues related to the liability of foreignness and outsidership (Johanson and Vahlne, 2009) due to a lack of local legitimacy (Brouthers et al., 2016) and lack of understanding local customers' behaviour.

Our study highlights the role of digital ecosystem as an infrastructure enabling cooperation and knowledge sharing (Sussan and Acs, 2017). The digital ecosystem is a key characteristic of DBMs' value creation by fostering born digital firms' internationalization, and more specifically, digital start-ups firms. Future IE research on born digital firms should be not only on how well embedded the firm is in the local ecosystem but also on how the firm can create new value creating relationships as it expands into new markets. Likewise, some scholars have investigated the role of platforms as a foundation of ecosystem collaboration (Kraus et al., 2019). Although recent research has had many efforts to understand the role of platforms in the born digital firms' internationalization, further empirical research could investigate about why some born digital firms internationalize faster than others, based on, for example, the interactivity and the business segment through digital platforms. Another important research direction suggested by our study, therefore, is the need to further explore the implications of on-line-offline integration activities and how this trend shapes firms' internationalization.

Future research might also examine which specific digital ICTs allow scalability and replicability of DBM, since they could be crucial to enable born digital firms grow internationally. Little is known about how digital technologies can best be captured to support born digital firms' new digital product/services design and business model adaptation, and how users contribute to and shape the born digital firm in new markets.

There are also potentially insightful investigations to be developed involving born digital firms' internationalization at the individual level (Li et al., 2018; Dillon et al., 2020). The importance of e-entrepreneurs and their key role in born digital firms' competitive strategies and international expansion is also an important phenomenon that needs further research development.

Finally, further research on revenue model as a key component of digital value capture could also bring insights to current IE literature (Teece, 2010; Mac Cathmhaoil, Evers and Gliga, 2021; Stallkamp et al., 2022). Indeed, the strong connection between the three value dimensions of DBM may indicate that a sound value proposition and a highly efficient value creation and delivery infrastructure are not sufficient for maintaining a profitable business in a sustainable way.

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CHAPTER 5

Factors influencing Born Digital Firms’ International Growth: A Qualitative Approach on Business Models

Abstract

Despite in the last two decades researchers have increasingly raised questions regarding the impact of the Internet and digital technologies on the ways that firms operate and create value in international markets, International Entrepreneurship research is particularly scarce in identifying the underlying drivers of born digital firms’ internationalization. Besides, the degree to which new digital ventures internationalize is highly heterogeneous, suggesting that a holistic approach of the company might be valuable to identify the key elements of its international growth. For this purpose, the digital business model approach seems to be a suitable framework for fulfilling the objectives of this study. We theorize that certain business model characteristics play a central role in explaining why some born digital firms internationalize faster than others. We conduct an inductive research approach, based on a qualitative multiple case study of born digital firms.

Keywords: *Born Digital firms, Digitalization, International Growth, Business Model, Digital Business Model*

1. Introduction

The use of advanced digital Information and Communication Technologies (ICTs) allows companies to identify opportunities for improvement, provide challenges to growth and share international activities. Digitalization is transforming how International Business is conducted (Coviello, Kano and Liesch, 2017; Alcácer, Cantwell and Piscitello, 2016; Vahlne and Johanson, 2017). The phenomenon of digital firms and their internationalization has been investigated by researchers in the last two decades regarding the impact of the Internet and digital technologies (e.g., IoT-Internet of Things, big data and analytics, robotic systems, and artificial intelligence)

on the ways that firms operate and create value in international markets (Brouthers, Geisser, and Rothlauf, 2016; Wentrup, 2016; Chen, Shaheer, Yi, and Li, 2019).

This research focuses on the internationalization of so-called born digital firms, using the definition of a firm that “relies on the Internet for its production, operating and delivery processes” (Monaghan et al., 2020). Born digital firms leverage digital technologies to provide their digital products and services to customers worldwide over the Internet (Brouthers, Geisser, and Rothlauf, 2016; Ojala, Evers, and Rialp, 2018; Vadana, Torkkeli, Kuivalainen, and Saarenketo, 2019) soon after inception. Digital products and services can easily be exported to remote markets because globe-spanning Internet-based distribution channels, such as app stores and online platforms, permit nearly costless and instantaneous delivery (Hennart, 2014; Mahnke and Venzin, 2003; Bharadwaj, El Sawy, Pavlou and Venkatraman, 2013; Autio, Mudambi and Yoo, 2021). Indeed, recent International Entrepreneurship (IE) and International Business (IB) literatures suggest that born digital firms tend to be INVs or born-global firms (Autio et al., 2018; Brouthers et al., 2016), because their products are “instantly accessible from anywhere in the world” (Brouthers et al., 2016, p. 514). Some studies argue that the behaviour of born digital firms might deviate considerably from what the Uppsala model predicts (Forsgren and Hagström, 2007).

More recently, however, several researchers have pointed out that born digital firms follow different patterns of internationalization of INVs or born-global firms, arguing that digital firms face costs and difficulties in the local contexts where they operate (Stallkamp and Schotter, 2021; Verbeke and Hutzschenreuter, 2021), especially those related to overestimating the non-location-boundedness of firm-specific advantages (FSAs). Some scholars propose that born digital firms are not immune to differences between countries in terms of cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede virtual internationalization (Shaheer and Li, 2020). Other studies indicate that the early internationalization and subsequent foreign market entries are governed by layered modular architecture, (Ojala, Evers, and Rialp, 2018), and its dependent on the platform provider’s capability to replicate a workable architecture stack in a target country. Hence, IB and IE research fields face two divergent conceptualizations of born digital firms’ internationalization. There seems to be significant heterogeneity in the extent to which born digital firms achieve global reach (Mahnke and Venzin, 2003; Bell and Loane, 2010; Chen, Shareer, Yi, and Li, 2019). Nonetheless, extant literature has yet to systematically analyse what specific costs and challenges digital firms encounter and the implications for their internationalization, leaving critical gaps to explore.

Among several studies of born digital firms’ internationalization, few scholars recognized that the business model characteristics play a central role in explaining how born digital firms reach international markets and their heterogeneity in the internationalization processes. Some scholars

propose the three essential components of the business model conceptualization, namely, the value proposition, value creation and delivery infrastructure, and value capture, as a recommendable framework for a differentiation of internationalization strategies among born digital firms (Brouthers, et al., 2016; Hazarbassanova, 2016; Yonatany, 2017; Strange and Zuchella, 2017; Witkop, et al., 2018; Hänninen, et al., 2018). The business model represents a relatively formal illustration of how a firm integrates its core activities with location and modality, drawn together by its strategic and operational intentions (Onetti, Zuchella, Jones, and McDougall-Covin, 2012). Indeed, research on business models has stimulated new reflections on the mechanisms and factors that drive digital firms to engage and enhance their innovations, outcomes, and processes to foreign markets. A new-born research stream has suggested new theoretical frameworks on key-value dimensions of born digital ventures' business models to grow globally. The impacts of value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), the specific way of creating value and the individual customer interface used by a digital business play key roles in digital internationalization (Vadana, et al., 2019; Gabrielson, et al., 2021). Very recent research proposes a “*globalise framework of business model*” grounded on several elements which have enabled born digital companies to operate and grow internationally (Mac Cathmhaoil, Evers and Gliga 2021). The new digital business models are enabled that have the potential to scale globally through the replication of a global business model across foreign markets (Reuber et al., 2021; Autio, Mudambi, and Yoo, 2021). However, other scholars point out that some digital firms have great difficulty to replicate a successful home-country business model overseas, and, therefore, these companies are not inherently global (Rong, Kang, and Williamson, 2022; Stallkamp et al., 2022).

To address these gaps, our research focuses on digital business model framework by providing useful lens through which to analyse the complex and dynamic internationalization processes that born digital firms may need to develop. The business model (BM) concept itself is yet a relatively new field of research, and it has since been accepted as an object of interest in Information Systems (IS) research (Osterwalder et al., 2005; Veit et al., 2014). The economic leveraging of novel technological opportunities in a dynamic and uncertain digital world requires born digital firms to implement adequate BMs, from now on referred to as digital business models (DBMs) (Al-Debi et al., 2008; Chesbrough, 2010; Veit et al., 2014). In sum, the BM is a tool to conceptualize the “blueprint how a company does business” (Osterwalder et al., 2005, p. 2). Our study follows DBM as Veit et al (2014 p.48) define: “*A business model is digital if changes in digital technologies trigger fundamental changes in the way business is carried out and revenues are generated.*” Digital technologies have triggered the emergence of new business models as a new way of how firms organize for value creation, delivery, and capture (Baskerville, Myers, and

Yoo, 2020; Autio, 2017). Therefore, digitalization provides a rich context to further understand business model-based development and its implication for IB and IE theories.

Thus, the relation between digital business models' components of born digital firms and their internationalization strategies has strong evidence but is not enough explained by IB and/or the IE theories. Research is still scarce in identifying and understanding how digital business models' components of born digital firms are unfolded in a way to enable these firms internationalize in terms of earliness, scope, and extent. Due to the nascent state of IB and IE research theories on this topic, our theoretical understanding of digital business models and the role played on the born digital firms' internationalization remains underdeveloped.

Accordingly, the aim of this study is to develop a comprehensive understanding of how born digital firms internationalize in the digital market, and why their internationalization could differ from one another. In seeking to explain heterogeneity in the internationalization of born digital companies, we focus on digital business model dimensions that have not been sufficiently considered in prior research.

For this purpose, the DBM approach seems to be a suitable framework for fulfilling the objectives of this study. Thus, the research questions to be formulated in this study are the following:

- 1) *How do digital business models' dimensions impact on international growth of born digital firms?*
- 2) *Why do some born digital firms internationalize faster than others in accordance with their digital business models' characteristics?*

The above-mentioned research questions are answered through an inductive research approach, based on a qualitative multiple case study (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Yin, 2003). Our initial review of the practitioner literature and media reports, as well as preliminary expert interviews, could indicate the presence of heterogeneous internationalization patterns among born digital firms. A multiple case study design is particularly suitable for examining this heterogeneity, as it allows us to compare different firm cases.

Accordingly, we contribute to and expand on existing International Business and International Entrepreneurship fields literature and theory in several ways. First of all, we contribute to the International Entrepreneurship literature by revealing how different typologies of born digital firms' business model are developed in a way to internationalize in a digital context. Secondly,

we contribute to internationalization theories by examining the internationalization patterns among born digital firms in order to identify whether their internationalization paths differ or not from each other. Finally, our study responds to calls of research for advancing the drivers on born-digital start-ups internationalization at firm level.

We will structure this paper into five sections as follows. Our theoretical framework will be discussed in the following section. The subsequent section will describe the research design followed by empirical findings and our propositions. Finally, we discuss the theoretical implications of our findings and conclude with future research implications.

2. Theoretical Framework

2.1. Born Digital Firms

Digitalization has been driving transformation in organizational structures, business processes, resource-seeking strategies of firms, and specialization and cooperation in global value chains (Brouthers et al., 2022; Ojala et al., 2018; Strange and Zucchella, 2017; Vadana et al., 2019). The widespread adoption of digital technologies has led to a proliferation of so-called born digital ventures, which prior research has defined as firms formed around fully digital products, such as software, mobile apps, and digital platform services, that can be distributed entirely through virtual channels (Coviello et al., 2017; Monaghan et al., 2020; Shaheer, 2019). Born digital firms are uniquely positioned to leverage their digital resources in foreign markets because the intangible nature of their products and services allows them to serve customers via Internet, potentially without any physical interaction (Shaheer and Li, 2020).

Recent research has advanced on the categorization of born digital firms considering the digitalization affects the value entire chain and the functions in the organization such as marketing, sales, and customer support (Vadana et al., 2019; Gabrielson et al., 2021) in contrast with the definition point out by Monaghan et al. (2020) which is based on that digital firms can categorize as digital on non-digital-based on their trade name. For example, Monaghan's et al. (2020) definition consider the telecom and software firms as non-digital firms since they do not rely on the Internet to fulfill production and delivery activities (Gabrielson et al., 2021). However, several software firms like Adobe (categorized as a non-digital firm by Monaghan et al., 2020) have cloud services (like Adobe Creative Cloud) where software tools and content are available through the Internet.

In this study, to avoid confusion, we may adopt the term “born digital firm” to denote (1) firms whose digital business models are based on digital Information and Communication Technologies (ICTs) (e.g., big data, robotics, artificial intelligence, among others), (2) the firm's products or

services can be marketed and sold by relying on digital infrastructures (the Internet, email, etc.), (3) the firm's products or services can be delivered by relying on digital infrastructures (the Internet, email, etc.) (4) these firms are digital from inception, and, (5) these firms provide digital goods and services. There are many different types of digital goods and services provided through digital firms. Some of the services or goods are purely digital whereas some of the services or goods combine both digital and physical components (Gabrielson et al., 2021). Purely digital goods and services are broadly defined as "experience goods encoded as a string bits" (Mahnke and Venzin, 2003, p.119): "*the goods do not perish or require transportation; have no diminishing return to scale; have great benefits of economies of scale; might inherit network effects; might produce valuable data*". Examples of purely born digital firms include digital platforms, providers of digital solutions, and digital content producers/distributors of goods and services in digital format, such as Facebook, Netflix or Spotify. With respect to categories of born digital firms involved in both digital and physical products and services distribution, our study refers basically Internet retailers and e-commerce platforms, such as Amazon and Alibaba.

2.2. Internationalization theories on Born Digital Firms

Extant International Business (IB) and International Entrepreneurship (IE) research on digital firms has applied two broad types of internationalizations process theories: the Uppsala model, as well as the more recent theory on International New Ventures (INVs) and born global firms.

These two divergent conceptualizations of born digital firms' internationalization postulated by IB and IE research fields are based on how such firms are structured, how firms interact with users, and how innovations are fostered globally (Brouthers, et al., 2016; Nambisan, 2017; Onetti et al., 2012). Some scholars have highlighted the enabling effects of digital technologies for early, rapid, and extensive internationalization (Autio and Zander, 2016; Coviello et al., 2017; Monaghan et al., 2020; Reuber et al., 2014). Digital products and services can easily be exported to remote markets because the Internet permits nearly costless and instantaneous delivery (Hennart, 2014; Mahnke and Venzin, 2003). When value-adding activities need to be performed in foreign markets, digital ICTs often allow firms to externalize these operations by improving communication and monitoring (Autio and Zander, 2016). Scholars have argued that these factors substantially reduce the need for market-seeking foreign direct investment (FDI) (UNCTAD, 2017).

A driver behind the swift international expansion among born digital firms is the rapid speed and competition in the sector. It is generally stressed, and there is an underlying assumption in the industry, that first-mover advantage is crucial. Chen, Shaheer, Yi, and Li (2019) refer to this as

the phenomenon of “winner takes it all”. The online industry is characterized by a pattern in which leading firms capture a disproportionate share of the market during a short time span via network effects, and this puts pressure on competing firms to engage in rapid internationalization. Additionally, in the case of digital web and mobile apps, Shaheer and Li (2020) argue entry barriers may not impede offering their digital products/services. These firms can join globally accessible online platforms that internalize many barriers to internationalization, such as the presence into foreign markets, payment mechanisms, and trust between businesses and users (Autio et al., 2017; Nambisan, 2017). Affiliation with such platforms grants purely digital products/services global accessibility from inception with little or no barriers to entering foreign markets.

Although the impact of digital technologies is indubitable, other scholars have demonstrated how born digital firms face critical factors for early internationalization, such as their technical modular architecture, (Ojala, Evers, and Rialp, 2018), the differences between countries in terms of cultural, administrative, geographic, and economic (CAGE) distances (Shaheer and Li, 2020), or the technical complexity of the nature of digital service/product (Wentrup, 2016). Besides, some born digital firms are more likely to assume that online interactions generate insights not only on buyer behaviour and preferences, but also about the underlying market conditions that shape customer preferences and behaviour. The possibility of a “virtuality trap” is stronger in the case of purely digital products/services (Yamin and Sinkovics, 2006) since it may create a perception of reduced psychic distance.

Recent research has analysed how born digital companies overcome or enhance their limits (e.g., capabilities, budget) by assembling their internationalization strategies with various available online–offline elements of their digitalized value chain, such as digital technologies, organizational marketing activities, and networks (Vadana et al., 2019). In line with Vadana et al. (2019), Gabrielson et al. (2021) set up a new theoretical framework to explain the relation between the degree of digitalization of the value chain and the international earliness of digital firms. Their study points out that it is necessary to distinguish and clearly define different typologies of firms approaching international markets and deploying digitalization in some or many of their business functions for a better understanding of their international earliness. Recent research proposes a “*globalise framework of business model*” grounded on several elements which have enabled born digital companies to operate and grow internationally (Mac Cathmhaoil, Evers and Gliga 2021). Scholars have extended the concept of born global to born digital firms as firms that seek rapid growth through the replication of a global business model across foreign markets. (Mac Cathmhaoil et al., 2021; Reuber et al., 2021; Autio et al., 2021). As Autio et al. (2021) state “*As services and interactions are increasingly digitalized and modularized, and as digitalization increasingly permeates even physical products, enabling them to be connected to digital*

platforms, new business models are enabled that have the potential to scale globally—and to disrupt established incumbents” (Autio et al., 2021, p. 5).

Very recent research, however, has highlighted several non-technical factors which come to limit the ability of many born digital firms to exploit their digital resources globally (Verbeke and Hutzschenreuter, 2021; Stallkamp and Schotter, 2021). Basically, the new challenges and costs associated with born digital firms globalization pointed out by these scholars are related to a cross-border demand heterogeneity between users, and how born digital firms deploy non-fully digital complementary resources (e.g., sales and customer service teams) to digital assets for capturing value (Teece, 1986, 2018; Verbeke and Hutzschenreuter, 2021). The demand heterogeneity and the role of non-digital complementary resources create growth bottlenecks that limit the ability of born digital companies to rapidly pursue international opportunities (Stallkamp et al., 2022). This is in line with recent study pointing out that digital firms have great difficulty to replicate a successful home-country business model overseas depending on the characteristics of their industry and the business model they are attempting to establish, and, therefore, these companies are not inherently global (Rong, Kang, and Williamson, 2022). Even those FSAs that can be transferred abroad, generally need to be integrated into local networks of complementary partners and stakeholders through digital ecosystems, what Li et al. (2019) refer to as “Ecosystem-specific advantages (ESAs)”. Despite IE research highlights born digital firms’ BM as a “potentially global BM” based on “*uniformity of the firm’s value proposition, and value-creating and value-capturing mechanisms across country markets*” (Reuber et al., 2021, p.1033), some local adjustment is always required; for instance, a firm may need to factor in currency or language differences. Thus, born digital firms face costs and difficulties of re-building the non-transferable ecosystem-specific advantages, as a Rong and colleagues (2022) refer as liability of ecosystem integration (LoEI).

Based on the review of previous literature, it is quite evident that research has advanced the understanding of born digital firms’ internationalization (Monaghan, et al., 2020) by merging concepts from IE, IB and IS literature. There seems to be significant heterogeneity in the extent to which born digital firms achieve international growth (Mahnke and Venzin, 2003; Bell and Loane, 2010; Chen, Shareer, Yi, and Li, 2019).

Regarding the international growth concept, our study is based on three constructs as IE literature (Oviatt and McDougall, 2005) has conceptualized: earliness as a duration between the firm’s establishment and the first sales to international market; scope as a range of locations where the company develops its business (Zahra and George, 2017; 2002); and extent as proportion of foreign sales to the company’s total sales turnover.

Hence, to further understand the underlying drivers of born digital firms' international growth, the business model-based approach might be a suitable framework. The differences of the three key-value dimensions of BMs among born digital companies might also help our understanding of why some born digital firms internationalize faster than others.

2.3. Conceptualizations of Business Models

The concept of "Business Model" (BM) has come to be widely studied in management disciplines such as strategy, technology innovation, and marketing, and more recently international entrepreneurship (IE) (George and Bock, 2011; Onetti et al., 2012; Child et al., 2017). The term is commonly used to identify how firms do business in order to create value (Demil et al., 2015). A wide range of definitions have been used in the literature. Different researchers depict BMs graphically, narratively, or as an activity system (Magretta, 2002; Osterwalder and Pigneur, 2010; Zott and Amit, 2007). An example of the most relevant definition from the generic stream of the business model literature is the one coined by Osterwalder (2005): *"A business model can be defined as a framework that allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams"* (Osterwalder et al., 2005: 17–18). Influenced by the Balanced Scorecard approach (Kaplan and Norton, 2001;1992), Osterwalder (2005) proposed a framework based on four pillars (product, customer interface, infrastructure management, financial aspects) and nine building blocks (value proposition, target customer, distribution channel, relationship, value configuration, capability, partnership, cost structure and revenue model). Zott and Amit (2007) argue that the essence of a business model design lies in its "activity system" which is a set of interdependent organizational activities through which human, physical and/or capital resources are brought together to fulfill the firm's objective. Another important definition was provided by Teece (2010, p. 179): *"A business model articulates the logic, the data, and other evidence that support a value proposition for the customer and a viable structure of revenues and costs for the enterprise delivering that value. In short, it's about the benefit the enterprise will deliver to customers, how it will organize to do so, and how it will capture a portion of the value that it delivers."*

Based on the previous review of literature, it is apparent that while many authors offer definitions of the term business model, definitions are heterogeneous, and none appears to be generally accepted. However, there is an agreement that BMs serve as frameworks through which firms can implement their strategies (McGrath, 2010), thus providing clarification on how value is created and captured (Osterwalder and Pigneur, 2010; Teece, 2010). This definitional ambiguity suggests

a need to conceptualize the BM more formally, and to distinguish it from the business strategy, supporting processes and metrics, thus separating and de-layering it from the multi-layer business decision process (Osterwalder et al., 2005).

Accordingly, our study is grounded on definitions of BM formulated around the value logic in terms of creating, delivering and/or capturing value (e.g., Chesbrough, 2002; Osterwalder and Pigneur, 2010; Teece, 2010). Besides, our study is grounded on the assumption that the value dimensions of a BM are interdependent, that is, the combination of the three value mechanisms forms the globality of a firm's BM (Shafer et al., 2005; Clauss, 2017). Thus, our study provides an entire BM definition and conceptualization that could be applied in a digital context, as we analyze in the following.

2.4. Digital Business Models

Despite the number of studies on born digital firms' business models has increase in recent years, research on how digitalization has impacted in the three three key-value dimensions of BMs is still in its infancy.

According to the definition of born digital firms mentioned above, we analyse the Information Systems (IS) literature on digital business models' characteristics to shed some light on DBM typologies. In this section we will also discuss the key-value dimensions of digital business models to link them to the business model conceptualization discussed above.

2.4.1 Digital Business Models' Typologies

There are few definitions in the IS literature that attempted to deliver a precise definition of a digital business model. As Veit et al (2014 pg.48) define: "*A business model is digital if changes in digital technologies trigger fundamental changes in the way business is carried out and revenues are generated*". Other scholars define digital business models how a firm creates and captures value through extensive use of digital artifacts (Laudon and Laudon, 2018). Digital artifacts as bits and bytes differ from physical artifacts as they can be characterized as editable, interactive, open/reprogrammable, and distributed (Kallinikos et al., 2013), and they can thus be easily modified and scaled.

Research on IS has evolved by analysing from e-business models to innovative business models such as smartphone applications, digital platforms, and digital native vertical brands (DNVBs) of e-commerce firms, as a major source of new typologies. With the advent of the Internet, many authors trying to describe and understand different e-business models. For example, Timmers (1998) described Internet business models (e.g., e-shop, e-procurement, 3rd party marketplace, virtual communities, collaboration platforms, value chain service provider) following two classification criteria: functional integration and degree of innovation. Rappa (2000) established a classification the business models on the web (e.g., brokerage model, advertising model, manufacturer model, community model, subscription model, etc.) and Afuah and Tucci (2003) set up an Internet business models' typology based on the dominant revenue model such as commission, advertising, mark-up, subscription, fee-for-service. Later, the specific focus on e-business models lessened, although many of the newer models are still associated with technology as driver or enabler (e.g., Osterwalder and Pigneur, 2010). With the arise of new digital technologies (such as blockchain, cloud computing, or the IoT), born digital firms settled on digital platform businesses such as Google, Facebook, Amazon, Alibaba, and many others, have changed the value dimensions of business models. Bharadwaj et al. (2012) pointed out that during the last decade impressive improvements in information, communication, and connectivity technologies have unleashed new functionalities. Recent research has identified the major elements describing a digital business model, namely, smart products, digital smart services, digitalized processes, ecosystem, platform, and data analytics (Ahmad et al., 2020).

Regarding digital platforms' BMs, Göcke and Meier (2021) examine how this type of DBM grow in relevance in nearly every industry by an optimization of transaction costs or a significant increase in innovativeness to create and capture value. Besides, platform business models are characterized by a multi-sidedness of value creation and enable the emergence of a network ecosystem (Gawer, 2014). Sussan and Acs (2017) also examine emerging digital business models which highlight the sharing and voluntary contributing of users in online platforms as a game changer for transaction cost-based businesses. An example of this type of user-intensive business model are the multisided platforms whereby users provide free content (e.g., Facebook, Instagram).

With respect to e-commerce firms' BMs, research states that these companies engaged in electronic commerce from inception (Singh and Kundu, 2002), and with essential turnover derived from online transactions (Luo, Zhao and Du, 2005).The e-commerce firms are highly differentiated by their main activity (trading, service and production firms), type of products offered (digital or tangible goods and services) to diverse customers, representing various e-business models such as e-stores or international intermediary platforms (e.g., Alibaba, Amazon, Rakuten, eBay), having a different size, managed by the owner (entrepreneurial or family firms)

or by professional managers. The e-commerce platforms (business-to-business, business to consumer or consumer to consumer platforms) allow firms and users to interact, buy and sell products online (Li, Shu, Zhang, and Mao, 2018).

Other research analyses the categories of digital business models based on the functional aspects of the value proposition (Wirtz, 2019). This author distinguishes four business model categories for Business to Consumer (B2C) businesses, i.e., content commerce, context, and connection. For example, the value proposition can be developed on purely digital artifacts (e.g., content business model) or on physical products through a Digital Native Vertical Brand (DNVB) (e.g., commerce business model or vertically integrated consumer retailers that live exclusively on the web without a physical store presence). In this last case, through a DNVB, the product has become digitalized in the sense that a digital representation of the product has now become generally global. The marketing channel is digital to a certain extent, whereas the product itself is physical.

In sum, continuing digitalization and its impact on business models lead to various streams of literature that emerge parallelly and provide different typologies of digital business models (DBMs). Furthermore, it results in synonymously used terminology and concepts which leads to a lack of clarity. To avoid confusion, our study follows DBM conceptualization as Veit et al. (2014 p.48) state: *“A business model is digital if changes in digital technologies trigger fundamental changes in the way business is carried out and revenues are generated.”*

2.4.2 Key-value dimensions of Digital Business Models

Next, we identify how recent literature has highlighted the digital scope of the three key-value dimensions of BMs on which our study is grounded.

Digital Value proposition.

This dimension is viewed as the value received by the customers (Richardson, 2005) and a core component of the business model as the “proposition, which is accepted, rejected or unnoticed by the customers” (Shafer et al., 2005, Vargo et al., 2008). It also explicitly includes the intended customer or target market. The digital offerings can be described along five distinct characteristics: digital products, digital services, human services with complementary digital services, physical products with complementary digital services, as well as physical products with embedded digital technologies (Wirtz et al., 2010). Born digital firms have high novelty as they use digital technologies in their business model making it possible to provide their offerings with

efficiency, complementarities, or lock-in effects (Brouthers et al., 2016). Innovative value propositions can also provide a high level of involvement for the customers in value co-creation such as smart apps, drones, 3D printing (Troxler and Wolf, 2017).

Besides, born digital firms can address the value proposition to new customer demand and establishing new forms of customer engagement (Hartmann et al., 2016). Segmentation techniques based on activities, interests, and opinions dimensions (i.e., psychographic segmentation), may assist born digital firms in identifying behavioural-based profiles of their customers (Kotler et al., 2017). Thus, in-depth knowledge of target customers and markets allows born digital companies to create an offer well-suited to their customers' behaviour by developing their products and services based on personalization, commitment, and community building (Weill and Worner, 2013).

Digital Value creation and delivery

The value creation and delivery of DBM are grounded on the key activities, the key partners, and key resources of the business model. Value creation demonstrates how companies produce value for customers along the value chain (Zott et al., 2011; Teece, 2010; Clauss, 2017). In addition to the internal sources of competitive advantage, resources, and capabilities, the value creation dimension contains the structure of a company's external links, including suppliers, distributors, and collaborators (Richardson, 2005). One of the ways to create value by born digital firms is to develop their business model through a digital ecosystem (Srinivasan and Venkatraman, 2018). According to Li et al. (as cited in Sussan and Acs, 2017, p. 58), a digital ecosystem is “*a self-organizing, scalable and sustainable system composed of heterogeneous digital entities and their interrelations focusing on interactions among entities to increase system utility, gain benefits, and promote information sharing, inner and inter cooperation and system innovation*”. Based on digital ecosystems, born digital firms can scale their business by incorporating, for example, new added value services/products (Autio et al., 2017). With respect to capabilities developed by the e-entrepreneurs, research has pointed out the “digital start-up mindset” as an entrepreneurial attitude combined with a deep understanding of the scalable, open, born-global, generative nature of digital technologies (Zaheer, Breyer, Dumay and, Enjeti, 2018; Dillon et al., 2020). In fact, claims about the uniqueness of digital start-ups imply that the emergence of digital products/services requires a re-conceptualisation of human and social capital, organisations, ecosystems, and human behaviour in the start-up development process as “informed by the digital technology-perspective” (Nambisan, 2017).

Value delivery describes the way, the activities and processes in a company are employed to deliver the promised value to their key customer segments (Osterwalder and Pigneur, 2010; Baden-Fuller and Mangematin 2013). Both virtual channels and customer relationships are the components of value delivery dimension of DBMs. Virtual channels refer to how digital products and services of born digital firms are accessed through digital technologies, such as web-based applications or digital platforms, to be downloaded across multiple devices. Virtual channels are also referring to interactivity between several business segments (e.g., B2B, B2C, C2C). Value delivery requires that a company has the competencies to evaluate and employ the best channel to deliver the value proposition at cost-efficient prices. Customer relationships are one of the most important parts of this dimension because they can be established or changed through interaction and customer relationship management (Osterwalder and Pigneur, 2010; Clauss, 2017).

Digital Value capture

The value capture refers to revenue streams and includes how a firm makes money, or how the value that a firm offers to its end-users or network partners can generate financial revenue (Osterwalder and Pigneur, 2010; Teece, 2010; Zott et al., 2011). Revenues coming from direct or indirect monetization of data. An intensive exchange of data between companies and customers, as well as among companies, opens up opportunities for generating new revenue streams by selling this data to partners, either directly or after some enrichment by intelligent data aggregation services. It is common in born digital firms the multiple revenue stream approach. The revenue stream of digital business model involves hidden revenue generation model (such as charging advertisers for contextual advertising and receiving sponsorship and revenue-sharing fees from partnerships with retail chains), e-commerce model, “freemium” (free and premium) model, and subscription-based model (Teece, 2010).

The value capture component also clarifies the financial structure of the business in the economic model (Osterwalder et al., 2005). Born digital firms with purely digital offering can optimized cost structure since digital content has a low marginal cost for reproduction and delivery (Adner et al., 2019).

The value capture dimension of the DBM is essential because a sound value proposition and a highly efficient value creation and delivery infrastructure are not sufficient for maintaining a profitable business in a sustainable way. In the digital environment, consumers can pose challenges to digital companies if the expectation of getting a free offer is not provided (Teece, 2010). From a global perspective, the level of competitiveness of the market, the entrepreneurial leaders or top management teams, and the nature of the industry have impacts on the firm’s decision regarding its revenue model (Mac Cathmhaoil, Evers and Gliga, 2021).

In sum, our review of the IS literature on digital business models reveals that there are a variety of typologies used by born digital firms ranging from simple web and mobile application or e-retailers, to more sophisticated models like virtual communities, marketplaces, search engine or online brokers (Remane et al., 2017; Wirtz, 2019; Göcke and Meier, 2021; Brouthers et al., 2016). Besides, our review of the literature shows that digitalization is enabling companies to create new value in a diversity of ways to offer an innovative value proposition, as well as new ways to earn revenues (i.e., capture value) from the provision of information to users/customers (Teece, 2010). Accordingly, this study conceptualizes the DBM by including the nine components of Business Model Canvas presented by Osterwalder and Pigneur (2010) to facilitate the analysis of the sub-constructs of value dimensions of DBMs. Table 1 provides an outline of the DBMs' dimensions adopted in this study.

Nine Business Model Building Block Osterwalder and Pigneur (2010)	Sub-constructs of value dimensions in Digital Context	Digital Value Dimensions of BM
<i>Value Proposition</i> : gives an overall view of a company's bundle of products and services.	Digital Offerings	Value Proposition
<i>Target Customer/markets</i> : describes the segments of customers a company wants to offer value to.	Segments of customers and markets	
<i>Value Configuration</i> : describes the arrangement of activities and resources.	Digital organization	Value Creation and Delivery
<i>Partner Network</i> : portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value.	Value Networks and Key Partnerships	
<i>Core Competency</i> : outlines the competencies necessary to execute the company's business model.	Digital Capabilities	
<i>Distribution Channel</i> : describes the various means of the company to get in touch with its customers.	Virtual channels	
<i>Relationships</i> : explains the kind of links a company establishes between itself and its different customer segments.	Customer relationships	
<i>Cost Structure</i> : sums up the monetary consequences of the means employed in the business model.	Cost structure	Value Capture
<i>Revenue Model</i> : describes the way a company makes money through a variety of revenue flows.	Revenue model	

Table 1 Dimensions of Digital Business Model (DBM)

Next, our study focusses on how these dimensions and sub-constructs of digital business models have an impact on the international growth of born digital firms by analysing which specific characteristics in such dimensions and sub-constructs enable born digital firms' internationalization. In turn, our research focusses on to what extent differences on these digital dimensions play a central role in explaining why some born digital companies internationalize faster than others.

Therefore, this study conducts an empirical research based on born digital firms' international growth (according to our definition of a born digital firm, see above in Section 2.1) aiming to deepen how the characteristics of digital business models can be crucial. This study is grounded on business model analysis as an approach that can create a landscape providing insights into the

mechanics of key-value dimensions of DBM, which are essential during the early internationalisation stages and beyond.

3. Methodology

There are two major reasons for adopting a qualitative method. First, research on the internationalization of born digital firms is scarce (Autio, 2017). Second, our research objective is to go beyond the existing academic literature in understanding how born digital firms internationalize. Qualitative methods are particularly suitable for answering “why and how” questions, by generating rich data and providing researchers with an in-depth understanding of the phenomenon of interest (Yin, 2009). In view of our research objectives, a multiple case study design is chosen over alternative qualitative methods, such as ethnography or a single case study (Yin, 2009). Further, the evidence from multiple cases is often regarded as having more compelling support for the development of testable hypotheses, hence rendering the overall study more robust (Yin, 2013; Benbasat, Goldstein, and Mead, 1987)

This research uses an inductive research approach, based on a qualitative multiple case study (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Yin, 2003) followed by three-step process. First, we set out a rationale for case selection and objectives for the case studies. Second, we developed our data collection methodology. Third, we decided upon a strategy for analysing our data, including a data coding format and cross-case analysis.

3.1. Sample Selection

The theoretical basis that guides our selection of case firms is the DBM that describes the major components of a business, which help capture a holistic picture of a business (Timmers, 1998). To identify the born digital firms that fall under our study, we qualitatively depict a typology of digital business model based on the three key-value dimensions described in Table 1.

Consistent with the guidelines recommended by Yin (2003), the sampling strategy follow first the literal replication technique which refers to produce same results in the selected cases and second, the theoretical replication is aimed at producing contrasting results for predictable reasons within the cases. In this sense, to enable our cross-case comparison we chose a set of born digital firms covering the spectrum from those we expected to be characterized by different value proposition, value creation and delivery, and value capture.

Regarding literal replication involved our sampling was selected based on following criteria to ensure that cases fit into conceptual categories to enhance the explanatory power of case data

(Eisenhardt, 1989). Firstly, firms are born digital start-ups according to the born digital firms' criteria described in section 2.1 of this study. Secondly, firms are born digital internationalizing start-ups. As context is critical to validate qualitative case studies (Welch, Piekkari, Plakoyiannaki, and Paavilainen-Mäntymäk, 2011), we analyzed born digital start-ups that have been successful in international opportunity exploration and exploitation. Thirdly, to ensure the heterogeneity in our case study, the firms have been selected from different industries and different typologies of DBM. We also selected case companies with different size at the time of our case study. Nevertheless, the case selection undertook with similar firms' size (less than 10 employees) at the time of their foundation, by considering it relevant for our understanding of potential similarities or differences in their internationalization path. Finally, all the born digital start-ups have their headquarters located in Spain. The country and cases were not selected randomly but were based on the close connection of the author to the Spanish entrepreneurial ecosystem, which is recommended by Eisenhardt (1989), who asserts that choosing cases aimlessly is neither necessary nor desirable.

The final sample and the characteristics of the firms that took part in the study are provided in Table 2.

Company name	ALPHA	GAMMA	DELTA	ZETA
Activity description	Convert leads, capture data, and personalize client journeys in real-time - without coding	Lottery management via Internet for end-users and as a virtual channel for physical lottery stores	Health and nutrition advisory services to companies and end-users	Digital Native Vertical Brand of organic products
Year Founded	2017	2015	2019	2018
Employees	70	40	15	6
Industry	Software as a service (SAAS)(Chatbot Builder)	Online game	Healthcare services	Retail - Organic products (Food ad skincare) delivery
DBM's Typology	Digital platform	Web and Mobile App	Web and Mobile App	Internet Retailer (e-commerce) based on DNVB
Offering	Purely Digital Services	Purely Digital Products	Purely Digital Services	Physical Products
Business Segment	B2B	B2C	B2B and B2C	B2C
Revenue Model	Freemium and Pay-per-subscription	Single price revenue model and Pay-per-subscription	Freemium, Premium, and Pay-per-subscription	Single price revenue model and Pay-per-subscription
Num. Foreign Countries	60	5	3	5
Main International Operations	USA; Europe (UK Germany); Mexico; Brasil; India	Mexico; Peru; Colombia; Bolivia; USA	Mexico; Argentina; Chile	France; UK; Germany; Portugal; Italy
% sales in foreign countries	77%	40%	30%	40%

Table 2. Detail of the case companies

3.2.Data Collection

The data were collected from June 2021 to February 2022 through semi-structured interviews with key informants in the companies and aimed to identify meaningful notions according to the research objectives that had been generated (Eriksson and Kovalainen, 2008). In all four companies, interviews were conducted either CEOs or founders, members of board of directors and investors, who had extensive first-hand knowledge of their business model and firm's

international activities (see Table 3). All interviews were realized via Microsoft Teams, recorded, and transcribed. The average interview length was 60–120 minutes. For the interviews, we prepared an interview protocol composed of focused, open-ended questions to enable participants to comment on issues that they considered important. The questions and asking order were the same for all respondents (Gioia et al., 2013). The interviewing process included questions aimed at developing a clear understanding of the digital business model’ dimensions and the internationalization process followed by the companies from their foundation. More specifically, the case protocol was divided into three sections. We started the first section by asking the entrepreneurs about the company’s foundation, and their background (e.g., involvement in strategic decisions, employment duration within the company). The second section requested information about value dimensions of the BM (e.g., digital offerings, internal organization, partnerships, geographical distribution of the company’s business activities, and revenue model) with a focus on how they create and capture value through their digital products/services to grow internationally. In the third section, we asked about the internationalization process from the foundation of the company in terms of earliness, scope, and extent.

To avoid retrospective bias (Huber and Power, 1985; Miller, Cardinal, and Glick, 1997), we collected several types of secondary data, covering the entire history of the firm, with a view to validating the interview data whenever possible. The data included internal and external memos of the firm, such as a commercial and financial information from the year of its establishment, promotion materials for potential partners, press releases, video materials for advertising purposes, websites, brochures, and social media publications.

Company	Number Informants	Informants	Number interviews	Duration of Interview	Secondary Data
ALPHA	2	Founder and Vicepresident Customer Success and Sales	3	160 mins.	Webpages; Financial Reports; Press Releases
		Founder and member Board od Directors	1	40 mins.	
GAMMA	2	Founder and CEO	2	120 mins.	Webpages; Press Releases
		Investor	1	50 mins.	
DELTA	2	Founder and CEO	2	90 mins.	Webpages; Press Releases
		Investor	1	60 mins.	
ZETA	2	Founder and CEO	2	120 mins.	Webpages; Press Releases
		Founder and member Board od Directors	1	30 mins.	

Table 3. Data Sources and Participants Information

3.3. Data Analysis and Coding

The data analysis period covers the timeframe from the foundation of each company until February 2022. We adopted the Gioia method (2013) for data analysis. This method is inductive in nature and allowed us to iterate between data and theories. Despite the fact that there are some

variations between the analysed cases, this study concentrates on resemblance among them, which is necessary for obtaining the research outcomes (Walsh, et al., 2011). The observation of constant elements in a heterogeneous sample provides more solid grounding for a general process model (Eisenhardt, 1989; Eisenhardt and Graebner, 2007). For this purpose, four data analysis steps were undertaken.

First of all, we attempted to identify how interviewees understand international growth of their company through first-order analysis. This analysis is similar to Strauss and Corbin's (1998) notion of open coding (Gioia, Corley, and Hamilton, 2013). We repeatedly read the interview transcripts to capture the informants' meanings. During this process, we coded and compiled the initial coding table of each case in MS Excel. We also summarized the data from the interviews to get clear and all-inclusive inferences from interview data.

We thus derived a set of first-order concepts that represented informants' views of what was going on in each case setting (Van Maanen, 1979). In order to trace the connection between international growth and digital business model' dimensions, we used as a template the framework depicted in Table 1 by corresponding the initial research and framework proposed by Osterwalder and Pigneur (2010). Each case's idiosyncrasies were identified to discover particular DBM's characteristics that can deepen our understanding of how and why digital companies internationalize. These single cases were presented to the respondents (Yin, 2003).

Secondly, through the second-order analysis, we endeavoured to find theoretical interpretations for the first-order concepts derived in step one. We shifted back and forth between the derived concepts, the themes emerging from the concepts, and extant literature on DBMs and born digital firms' international growth for theories that could help us for a better understanding of concepts and themes. The first-order concepts were clustered and linked to second-order themes, which allowed identification of more fine-grained categorization of which specific characteristics of DBM' dimensions enable born digital firms to grow internationally. This step is iterative in nature. We engaged in repeated comparison and contrast of the first-order concepts, looking for both similarities and differences between them. We made conscious efforts to identify theoretical differences between the concepts so that we could group and congregate similar first-order concepts to allow second-order themes to emerge. Consequently, these second-order themes became the notions we used to "explain the patterning of the first-order data" (Van Maanen, 1979, p. 541).

As the second-order themes emerged and we gained a better understanding of main characteristics of key-value DBMs' dimensions to enable born digital firms' internationalization, we began to see if we could cluster and link the second-order themes into aggregate dimensions in the third

step. For the purpose of our study, we were opened to using concepts identified in previous research to summarize the second-order themes and aggregate dimensions, a practice also embraced by Pan and Tan (2011). It was in this effort that we discovered that the second-order themes emerging from this study could be further categorized into aggregate dimensions as a key finding of the research that emerged from the analysed data.

Finally, we undertook a cross-case analysis to investigate how the international growth (i.e., earliness, scope, and extent) of our case-study firms was achieved by comparing the cases across our estimates of DBMs' dimensions while looking for similarities and differences (Eisenhardt, 1989; Eisenhardt and Graebner, 2007).

The data structure presented in Figure 1 summarizes the first-order concepts, second-order themes, and aggregate dimensions we derived from our data analysis process (Gioia et al., 2013).

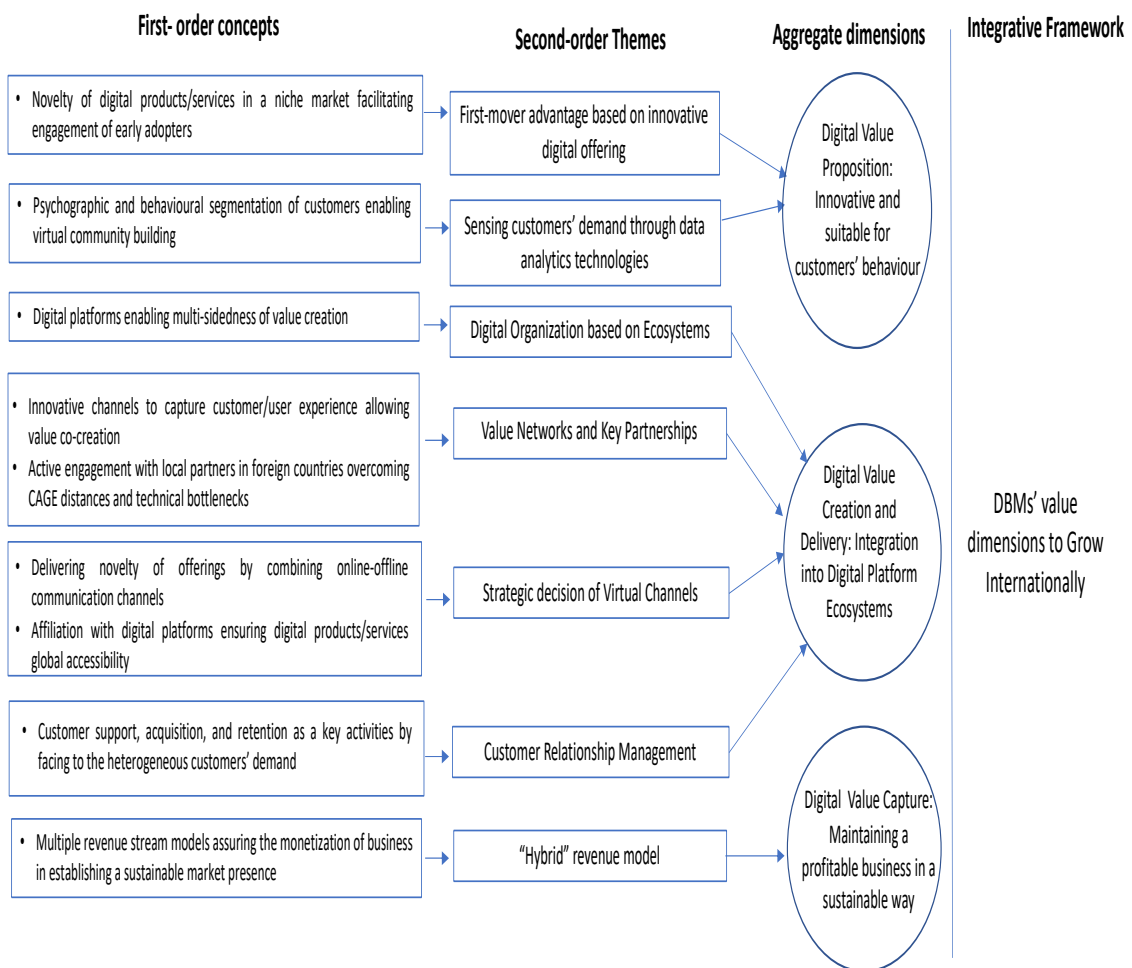


Figure 1. Data structure

4. Findings

4.1. Case firms' description and overview on their internationalization

Alpha is a Software as a Service (SAAS) digital platform established in Spain in 2017. Its digital offerings are purely digital services based on “no-code chatbot” development software to be integrated in CRM applications of companies. The target customers' industries are financial services, e-commerce, and other SAAS, either MNEs or SMEs (B2B business segment). Alpha engaged in international operations in USA from inception. This initial foreign market entry was developed through a digital platform based on Silicon Valley which is a marketplace for digital products from the global community of software makers. The company also focused on expanding its international operations to several countries in Europe, Latin America, and India. Alpha's international expansion is grounded on product innovation to early adopters. Its business strategy is based on “product-led growth” (PLG) which is more scalable, less prone to logistical problems than “sales-led growth” (SLG). In turn, it helps Alpha spend less on customer acquisition. The company reaches new customers and markets through social media advertising campaigns and Google Ads. Regarding the revenue model, it is based on pricing with three subscription payment plans and freemium model.

Gamma is a web and mobile application of purely digital products to end-users in the game (lottery) industry (B2C). Gamma's business strategy is also to serve as a virtual channel for physical lottery stores. The company mainly was focused to achieve success in the home-country before its international expansion. The international target markets were identified based on cultural proximity, big population, and lax regulation. The first target market was Mexico, where the company developed a year market experimentation process to assure the viability of the business due to both high operational and customers' acquisition costs. When the company was fully established, Gamma began its international expansion in other Latin American countries. International expansion in Europe was later considered by the company because these countries are mature markets with strong regulatory standards. Despite its purely digital product is instantaneously reproducible to unbounded scale and with low marginal costs, the main barriers are both language and the complex technical development. Gamma's international strategy is focused on Foreign Direct Investment (FDI) and partnership with local lottery sellers. Regarding its revenue model, its pricing is regulated by local authorities. Gamma applies a subscription plan to physical lottery stores.

Delta is a web and mobile application of purely digital services both to end-users and companies (B2C and B2B business segments). Its digital services are based on the assessment of healthy habits and nutrition. Regarding acquisition and retention of end-users (B2C), Delta aimed to build

a community of healthy lifestyle followers from inception. With respect to target customers' acquisition in the B2B business segment, Delta attained partnership agreements with Corporate Social Responsibility departments of companies. The company was mainly home-market oriented from inception, both in B2C and B2B segments. Once Delta targeting foreign markets, the firm identified some hurdles to internationalization, such as hiring specialized sales and customer service staff (health coaches) with foreign language proficiency. The company began its internationalization a year later from its establishment. Mexico was the first foreign target market due to the cultural proximity (e.g., language, healthy lifestyle). Due to Delta's limited resources to expand operations abroad, the company signed a partnership agreement with a digital healthcare services platform by aiming accelerate its deployment in Latin America. The company uses social media advertising campaigns as a communication channel and, in turn, for collecting information on its target customers. Regarding its revenue model, Delta has a freemium, premium, and subscription-based model both in B2C and B2B business segment.

Zeta is an Internet retailer based on a digital native vertical brand (DNVB) of food and skincare physical products to end-consumers (B2C business segment). The company aims to provide high natural and organic top-quality and healthy products. The raw material is imported from Japanese farmers, but the value chain activities such as manufacturing, delivering, and marketing, are developed in Spain. Besides, the company outsources production, logistics and delivering. The business opportunity was to introduce this scarce organic product in the European countries as an innovation through Zeta's DNVB by building a community of users. Despite the high price of these products in Japan, Zeta developed their DNVB in Europe as a "masstige" (mass market and prestige) brand, due to the lowest costs of value chain' activities in Spain. The company began their operations abroad in 2019, a year later from its foundation. Its international strategy was focus on France, United Kingdom and Germany. France was the first country where Zeta expanded its operations. From this first entry abroad, Zeta engaged its operations in other markets with a rapid pace. The main firm-specific advantages (FSAs) in these countries were accessible logistic process, few competitors, and competitive prices. However, the advertising cost was relatively high for customers' acquisition. The company also delivers its products through a global e-commerce platform (Amazon). The company uses social media platforms to promote itself and for collecting information on its target customers and markets, markets trends and competitors. Regarding its revenue model, Zeta combines single-base price with subscription-based model.

4.2. Digital Business Model' Dimensions to Grow Internationally

4.2.1 Underlying drivers of digital value proposition to grow internationally

All companies' digital offerings were fairly innovative with respect to their industries at that time. Overall, the companies combined the novelty of their offerings with the "first mover advantage" by addressing their innovative value proposition to early-adopter users. The best example is Alpha's initial approach to USA from inception. As vice-president of Alpha stated: *"We've built advanced solutions to create both interactive and complex experiences, and USA was the perfect market due to its early-adopter mentality"*

Regarding Gamma, Delta, and Zeta, initially focused their business on developing their presence in their domestic market, before pursuing opportunities in foreign markets by sensing the need of a better knowledge of their customers' demand. These companies also evaluated carefully their international opportunities based on the resources available.

"We firstly focused only on Mexico during one year before the international deployment in Latin America because we evaluated that our purely digital product was disruptive, and it could not be understandable by our potential customers. Moreover, the customers' acquisition costs were high" (Gamma CEO)

"Prior to our international deployment, we identified that cultural proximity, such as language, was crucial due to both costly country-specific adaptations and our limited resources" (Delta CEO)

All companies demonstrated a deep knowledge of their target customers and markets. Both psychographic and behavioural customers' segmentation were critical activities in developing a suitable offer. The cases suggest that B2C companies required greater knowledge of their customers' behaviour. For example, Zeta used big data analysis in developing totally new products in order to capture new market opportunities that were recognized in tandem with its initial value offering.

"Our analysis of customers' behaviour encouraged us to create a new product in a completely different sector from our initial offering, but our value proposition remained on organic products" (Zeta CEO)

We identified, therefore, that an innovative digital offering could be a salient factor to grow internationally. Nevertheless, we also identified some differences among the case firms, regarding their actively pursuit of opportunities in foreign countries. Specifically, B2C companies had to pre-emptively delay their international expansion by sensing target customer behaviour and assessing available resources should costly country-specific adaptations development. Despite

their instantaneously reproducible to unbounded scale of their purely digital offering, Gamma and Delta faced some barriers such as cultural distances or institutional context in expanding their operations. Regarding Zeta, the company grounded its international expansion on its “masstige” DNVB as a main driver. Zeta also faced cultural distances in its foreign market entry. Generally, B2C firms’ internationalization was slower due to the cost and time involved in creating a viable offering. According to our cases, B2B company (Alpha) enjoyed of its scalable core purely digital offering to internationalize easily from inception.

4.2.2 Underlying drivers of digital value creation and delivery to grow internationally

As mentioned before, the companies were sensitive to customer requirements and behavior, which influenced the business model adopted in international markets for value creation. All companies, except Gamma, joined globally accessible digital platforms that internalized several barriers to internationalization such as the presence into foreign countries or payment mechanisms. For example, Alpha joined a global digital platform of software makers community as a main channel for customer acquisition and payment mechanisms; Delta integrated its business into a digital healthcare services platform to enhance their market presence into foreign countries; Zeta joined an e-commerce platform (Amazon) as an alternative delivery channel for its products. With respect to Gamma, due to its offering was fairly dependent of country-specific regulatory norms, its approach to new countries was gradually offline with local staff and a physical presence in the market. As CEO Gamma stated:

“Our company is a born digital firm, but our approach to foreign countries has similarities with traditional companies. Our international strategy is based on foreign direct investments”.

It could be seen that the case firms, except Gamma, leveraged the benefits of digital ecosystems’ integration by building a value network into their organization. The case B2C firms were willing to build a virtual community of users for fully interactive multilateral communication through for example, social media platforms, or by providing their own virtual channel in their website. By capturing the user experience, B2C companies were able to take full advantage for co-creating value. As CEO of Delta stated:

“To enhance our B2C business segment it was crucial to build a community of healthy lifestyle followers”

Overall, the case companies highlighted active engagement with users and partners in their target markets as a critical factor. The case firms combined their digital assets with complementary local

assets for value creation. For example, Alpha's value creation was underpinned on strategic partnerships with technological companies, mainly for its "product led grow" business strategy. Delta signed a partnership agreement with a digital healthcare services platform as a main driver of co-innovation.

The cases suggest that B2C companies were more dependant of non-digital complementary resources in their target markets, such as sales and customer support staff or content producers. For example, Gamma had strong dependency on the institutional context which led to be heavily involved in complex interactions with regulators and governments. Its international expansion had been underpinned on specialized sales and management team by country. Delta combined online communication with offline communication channel by hiring specialized sales team and customer support in each country. Zeta was initially less dependent on physical presence in its foreign countries, by focusing on online communication channels such as social media and online advertising campaigns. However, the company identified some hurdles to internationalization due to cultural distances. As CEO of Zeta stated: *"We had initially struggle to sell our products in Germany due to cultural differences and social habits. Finally, we hired a native sales and marketing person for market development"*

The cases suggest that companies had to estimate accurately the challenges and costs associated with their value creation and delivery, especially those related to non-location-boundedness of their FSAs. For example, the diffusion of the novelty of their offerings through virtual communication channels such as social media platforms, in comparison with their physical presence into foreign countries, was a critical decision in overcoming cultural distances.

4.2.3 Underlying drivers of digital value capture to grow internationally

The value capture dimension of DBMs was essential for maintaining a profitable business in a sustainable way. Overall, the case companies highlighted the importance on the firm's decision regarding its revenue model. The monetization of their business from early stages was a challenge for all companies.

It could be seen that the case firms' value capture involved several typologies of revenue stream. For example, Alpha designed its value-pricing based on three subscription payment plans depending on customers' needs in offering a suitable pricing (e.g., "starter", "pro", and "large business"). As vice-president of Alpha stated: *"We also offer a "free base price" due to our main concern was to create traffic on our platform through a large network of users"*.

The cases suggest that it is common in born digital firms the multiple revenue stream approach. Despite the differences on their value proposition (purely digital services versus physical

products), Delta and Zeta decided to include a subscription model based on building community of users. As the CEO of Zeta stated: *“We primarily focused on single price as revenue stream. Later, our main goal was to apply a subscription plan based on volume discounting. Our approach by building a community of users was crucial”*. Delta also designed a hidden revenue model based on fees for advertisers of food products. Gamma’s revenue model was based on both single prices to end users and subscription plan to physical lottery stores. Due to the price of its digital product is fixed by local authorities in each country, the company had low advantages on its pricing to end users. However, as a virtual channel for physical lottery stores, Gamma managed a flexible revenue model based on subscription plans.

Overall, the case companies highlighted that subscription-based revenue model can enhance their business’ monetization, both in B2B and B2C business segment. The virtual community building of users was a challenge in implementing their subscription-based revenue model.

5. Discussion

Digitalization is enabling companies to create new value in a diversity of ways to offer an innovative value proposition, as well as new ways to earn revenues (i.e., capture value) from the provision of information to users/customers (Teece, 2010). Although the impact of digital technologies to grow internationally is indubitable (Autio and Zander, 2016; Coviello et al., 2017; Monaghan et al., 2020), the concept of global business model understood as a non-location-bound of firm-specific advantage that facilitate replication (Reuber et al., 2021) must be carefully scrutinized in a digital context. Our findings demonstrate that born digital firms may face costs and challenges in dealing with local contexts in their internationalization (Verbeke and Hutzschenreuter, 2021), and, therefore, they are not inherently global (Rong et al., 2022).

The findings indicate that born digital firms can develop an innovative digital offering addressed to “early-adopters mentality” of their potential users to cross-border transfer their FSAs, and therefore, it might enhance their international growth. However, an innovative digital offering itself may not be enough to enter a new market. We show that the international growth of born digital firms remains constrained by non-technical factors, such as heterogeneous customer characteristics. Despite the “scale free” characteristics of their purely digital value offering may allow born digital firms to expand their user base with very limited incremental investments, these firms had to adapt their value proposition as customer preferences and behavior vary across countries. Both psychographic and behavioral customers’ segmentation help companies to develop a well-suited value proposition, and in some cases, to innovate new products or services

by complementing the initial value offering. Our findings demonstrate how born digital firms were willing to innovate new products/services by approaching their customers' behaviour focused on the clear understanding of the underserved pain points of the customer. The implementation of digital technologies such as big data is crucial for customers' behavior segmentation. We propose that:

P1: An innovative digital offering jointly with a well-suited value proposition to customers' behaviour foster international growth of born digital firms.

Generally, born digital companies develop their digital value proposition based on customer-centric concept. However, there are some differences on how companies reach foreign countries with respect to their digital offering. According to the results of this study, B2C companies face higher costs and challenges in adapting their digital value proposition to local customer demand than B2B companies. For example, cultural differences or institutional barriers, can slow down B2C early internationalization. Prior research on international marketing points out that cross-border demand for consumer goods is generally more heterogenous than industrial goods, which tend to be culture specific and shaped by local tastes and other idiosyncrasies (Cavusgil et al., 1993); this heterogeneity could extent to digital consumer products/services as B2C customers expect a localized digital offering (Blum and Goldfarb, 2006; Shaheer and Li, 2020; Stallkamp et al., 2022). Therefore, we propose:

P2: Born digital firms in B2C markets tend to face higher costly country-specific adaptations than those in B2B markets. B2C firms are likely less aggressive in pursuing international opportunities early on.

The findings, therefore, indicate that born digital firms often need continual and localized learning in order to globalize their value proposition. Based on our findings, we note that such localized learning can afford through active engagement with local users, local partners and complementors, (Mac Cathmhaoil, Evers and Gliga 2021; Reuber et al., 2021). However, in some cases, such engagement needs to be supplemented by combining their digital assets with non-digital resources (Nambisan et al., 2019; Verbeke and Hutzschenreuter, 2021; Stallkamp et al., 2022).

We note that value creation and delivery dimensions of born digital firms are developed by integrating into a digital platforms ecosystem in order to globalize such dimensions and enjoying

of ecosystem-specific advantages (ESAs) (Li et al., 2019). Affiliation with digital platforms ecosystem can grant purely digital products/services global accessibility from inception with little or no barriers to entering foreign markets (Autio et al., 2018; Nambisan, 2017). The findings indicate that born digital firms' integration into digital platform ecosystem is crucial to cross-border transfer of their FSAs by enhancing the value creation and capture process. Since digital ecosystems are seen as open communities comprising different actors such as direct suppliers, complementors, regulatory authorities, the judiciary system, and research institutions (Teece, 2010), born digital firms' integration into digital ecosystem can facilitate value-creating mechanisms "obviating the need to enter into customized contractual agreements with each partner." (Jacobides et al., 2018, p. 2255).

Our findings demonstrate how born digital firms develop value networks and key partnerships through their integration into a digital ecosystem for value co-creation. For example, most companies are willing to build virtual communities for fully interactive multilateral communication between their users. The companies involve on-going value co-creation with local partners and local users afford competitive advantages in the new market (Li et al., 2019). We propose that:

P3: Born digital firms that integrate their DBMs' value creation and delivery into digital platform ecosystem foster their international growth.

Nevertheless, as mentioned above, born digital firms need to estimate the costs and difficulty of re-building the non-transferable ecosystem-specific advantages (ESAs) necessary to underpin a firm's business model in a foreign market (Li et al., 2019). Extant literature has stressed the potential for born digital firms to enter foreign markets without establishing a physical presence abroad, and without physical products crossing borders, using what has been labelled "online," "internet-based," "virtual" or "remote electronic access" internationalization (Pezderka and Sinkovics, 2011; Yamin and Sinkovics, 2006; Strange and Zuchella, 2010). However, other factors such as customer norms and habits could also create distances in the digital context. For instance, host country specific customers' online purchasing behaviors such as pricing (Luo et al, 2005) could possibly disadvantage foreign firms lacking sufficient market or cultural knowledge to acknowledge such behaviours in the host market. Thus, it is suggested that these liabilities or distances do not fade in the digital context, instead, they could even be exacerbated when they are also constrained by liability of smallness and newness. Such local market specific features also highlight the need to gain local market knowledge, which in turn will possibly require a local presence as such market knowledge may not be fully available online.

Based on the results of this study, born digital firms in B2C markets combine their digital assets with non-digital complementary local resources, such as physical presence of sales teams and customer support in foreign countries. This can create potential bottlenecks by limiting the ability of born digital companies for sharing the “scale-free” characteristics of the core digital product (Levinthal and Wu, 2010; Stallkamp, et al. 2022). Our findings indicate that their international expansion take more time and require substantial incremental investments, reducing the incentive for aggressive pursuit of early internationalization. The role of non-digital complementary resources forces cutting-edge born digital firms to engage in traditional, non-digital means of value creation and capture. Our findings also suggest that born digital companies without ecosystem specific advantages (ESAs) are more willing to internationalize gradually through foreign direct investments (FDI).

Thus, based on this study and the existing literature, born digital firms overcome or enhance their limits (e.g., capabilities, budget) by assembling their internationalization strategies with various available online–offline elements, such as digital technologies, organizational marketing activities, and networks (Wentrup, 2016; Vadana, et al., 2019). Therefore, we propose that:

P4: Born digital firms that complement their DBM’s value creation and delivery with non-digital resources are likely less aggressive in pursuing international opportunities early on.

One of the challenges faces by born digital firms is the business’ monetization from early stages of their development. Many of these digital businesses run at a loss for many years (Mac Cathmhaoil, Evers and Gliga, 2021; Stallkamp et al., 2022) confronting themselves what Gebauer et al. (2020 p. 314) refer to as a “*digitalization paradox*”, in which value-generation is expedited through digitalization, but value-capture through revenue generation is elusive. These insights might indicate that born digital firms’ revenue model is a key area, strategically used for international growth and increased competitiveness. Our findings indicate that born digital companies are willing to implement multiple revenue stream approach for maintaining a profitable business in a sustainable way. Overall, the companies highlight the subscription-based revenue model for enhancing their revenues abroad. The companies leverage a community building approach in order to engage their users into a subscription revenue plan. Likewise, companies select the freemium-based revenue model for customer acquisition, enhancing the network of users on their businesses, and therefore, overcoming liabilities of outsidership (LoO) (Brouthers, et al., 2016).

Nevertheless, based on this study and the existing IE literature, born digital firms also face liabilities of ecosystem integration (LoEI) (Rong et al., 2022) associated with the costs and difficulty of rebuilding the non-transferable ecosystem-specific advantages. Thus, the value capture dimension of their DBM is crucial for aggressive top-line expansion through international revenue generation in a sustainable way. This is in line with prior studies indicating that a sound value proposition and a highly efficient value creation and delivery infrastructure are not sufficient for maintaining a profitable long-term business (Teece, 2010; Mac Cathmhaoil, Evers and Gliga, 2021). Therefore, we propose that:

P5: A value capture dimension underpinned on multiple revenue model fosters international growth of born digital firms.

Next, we present the conclusions and highlight the importance of investigating the impact of DBMs' dimensions in born digital firms' internationalization and point out avenues of future research that are relevant for both theory and practice.

6. Conclusion

The results suggest that born digital firms' BMs have key features that might foster their international growth (Mac Cathmhaoil, Evers and Gliga, 2021; Reuber et al., 2021; Autio, Mudambi, and Yoo, 2021). As IE literature highlights, digital assets have brought about new kind of firm-level internationalization (Gabrielson et al., 2021; Verbeke et al., 2021) and such internationalization path is highly heterogeneous among born digital firms (Brouthers, et al., 2016; Hazarbassanova, 2016; Yonatan, 2017; Strange and Zuchella, 2017). Our study points out that digital business model analysis can create a landscape by providing insights of how born digital firms operate and create value through the key-value dimensions mechanisms across foreign markets, and, in turn, why some born digital firms internationalize faster than others.

Overall, born digital firms can be potentially powerful born-global whose expansion across geographical boundaries is facilitated by light assets and the low costs of extending online business models. Born digital companies aim "globalize" their DBM to cross-border transfer of their non-location bound FSAs either from birth, or soon after their foundation. It is crucial first-mover advantage (Chen, Shaheer, Yi, and Li, 2019) since leading firms capture a disproportionate share of the market during a short time span via network effects, and this puts pressure on

competing firms to engage in rapid internationalization. As mentioned above, IE literature states “global business model” focuses on the uniformity of the firms’ value proposition, value-creating and value-capturing mechanisms across foreign countries that facilitates replication (Reuber et al., 2021). Some scholars extended the concept of global BM to born digital firms as firms that seek rapid growth through the replication of their BMs across foreign markets (Mac Cathmhaoil, et al., 2021; Reuber et al., 2021; Autio et al., 2021). For example, digital offering can significantly reduce the dependence of many business activities and interactions on physical proximity like those imposed by transportation and co-location (Mudambi, 2008). Nevertheless, our study reveals how born digital firms face some hurdles to cross-border transfer of their FSAs early on.

Our study also reveals that there are no significant differences in this respect between purely and non-purely digital offering among B2C companies’ internationalization. In some cases, these purely digital resources may face institutional and legal restrictions from host governments when firms implement them as part of cross-border strategies (Kallinikos, 2010). Further, when customer value propositions include both digital and non-digital complementary resources (Stallkamp et al., 2022), these latter elements may be location-bound. Thus, it is crucial for born digital firms accurately estimate the extent to which the firm-specific advantages provided by digital technologies are both location and non-location-bound (Verbeke & Hutzschenreuter, 2021).

Regarding born digital firms in B2B markets, our study suggests that they can replicate their DBM from inception based on their “scale-free” core digital offering (Reuber et al., 2021; Stallkamp et al., 2022). High levels of technical knowledge and common industry standards, including coding languages, application programming interfaces (APIs), and the widespread use of English, can create a shared understanding among technology professionals across countries (Hennart, 2014).

The results accentuate the importance of digital platforms ecosystems integration in born digital firms’ internationalization (Brouthers, et al., 2016; Ojala, Evers, and Rialp, 2018; Autio, Nambisan, Thomas, and Wright, 2018; Li et al., 2019). To realise the potential competitive benefits of FSAs in a new market, born digital firms often require access to local networks of external complementors (Li et al., 2019; Parente et al., 2018). Our study points out that born digital firms’ integration into digital platforms ecosystem allow them to internalize some barriers in entering foreign markets (Autio et al., 2018; Nambisan, 2017), and enhance their value co-creation (Sussan and Acts, 2017).

The results also further accentuate the importance of the born digital firms' value capture dimension of their DBMs as a challenge for aggressive top-line expansion through international revenue generation in a sustainable way.

Overall, this study shows that the degree to which born digital firms internationalize is highly heterogeneous. While existing literature has mainly focused on the positive effects of digital assets and capabilities of born digital firms' BM to internationalize, this study shows that firms may face costs and challenges in dealing with local context abroad, and therefore born digital firms are not inherently global. Further, we find that from the perspective of DBM there has been relatively little research on how digitalization challenges internationalization theories.

7. Limitations and Further Research Directions

This research has several limitations, and some of them are inherent to qualitative research methods (Benbasat, Goldstein, and Mead, 1987), which can provide potential future research avenues.

Most important is the degree to which the findings are generalizable across born digital firms' BMs. Our study was limited to four born digital firms located in Spain, and therefore, it is possible that research context has influenced their actions in developing BMs to internationalize. Nevertheless, born digital companies mostly varied by typology of DBM, industry, size, date of founding, and business stage. Further research could build and test propositions in the same industry and for different types of BMs, and, in turn, for the same typology of BMs across different contexts (e.g., market, industry). Moreover, future research in the form of longitudinal, cross-country, and cross-cultural studies is encouraged.

In seeking to explain heterogeneity in the internationalization of born digital firms, we made several design decisions related to the three key-value dimensions of BM Canvas provided by Osterwalder and Pigneur (2010) that could be applied in a digital context. More empirical research is needed in order to clarify the role of digital BM's dimensions in IE literature.

According to the findings of this study, born digital internationalizing firms can develop their BMs at global scale by integrating into digital platforms ecosystems. Our research was grounded on the assumption of digital platform ecosystem as a multisided structure where a platform owner implements governance mechanisms to facilitate value-creating mechanisms on a digital platform between the platform owner and an ecosystem of autonomous complementors and consumers (Sussan and Acts, 2017). The terms of platforms and ecosystems are gaining popularity, but

sometimes their use lacks conceptual rigor (Zuchella, 2021). For future research, through robust conceptualization, the impact of digital platform ecosystem could be a promising avenue to inquire about the effective distinctiveness of this digital structure in comparison to other network structures already known.

Another important research direction suggested by our study, therefore, is the need to further explore the implications of on-line-offline integration activities and how this trend shapes firms' internationalization.

Future research might also examine which specific digital ICTs allow scalability and replicability of DBM, since they could be crucial to enable born digital firms grow internationally. Little is known about how digital technologies can best be captured to support born digital firms' new digital product/services design and business model adaptation, and how users contribute to and shape the born digital firm in new markets.

There are also potentially insightful investigations to be developed involving born digital firms' internationalization at the individual level. The importance of e-entrepreneurs and their key role in born digital firms' competitive strategies and international expansion is also an important phenomenon that needs further research development.

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CHAPTER 6

Conclusions, Limitations, and Future Research Directions

This chapter presents the main research findings from the four studies of this dissertation. It begins by revisiting and linking the research questions to the various results and findings presented in the dissertation. The theoretical contribution of the dissertation is discussed next, followed by managerial implications. Finally, the chapter concludes with a discussion on the limitations of the study and provides several suggestions for future research.

1. Revisiting the Main Findings

The aim of this dissertation was to explore and analyze the phenomenon of born digital firms' internationalization through two different research perspectives: at individual level and at firm level. The individual-level approach took into consideration the role of entrepreneurs' digital capabilities and their decision-making logic at recognizing international opportunities as a key driver in explaining early internationalization of a born digital start-up. The firm-level approach took into consideration the digital business model by analyzing the role of certain business model's characteristics affecting born digital firms' international growth. In order to achieve this goal, an extensive study was conducted over four years.

The following are the main findings related to the specific objectives of this thesis: born digital firms' internationalization is far from homogeneous, and these companies are not inherently global. The role of e-entrepreneurs in born digital firms' competitive strategies and international expansion is an important driver in explaining born digital firms' early internationalization. In seeking to explain born digital companies' international growth at firm level, digital business model dimensions offer an appropriate framework in explaining their heterogenous internationalization, and why some born digital firms internationalize faster than others.

The outcome of this dissertation was in the form of four studies, each of which answered the questions of the research. The first publication opened the way for a detailed exploration of born digital firms' conceptualization and their internationalization processes, answering the questions: "Which are the

underlying criteria for considering what might be a ‘born digital’ firm?” and “What is the relevance of the studies about born digital firms’ internationalization according to such criteria in IB and IE research fields?” Extant literature was investigated to define the typologies of born digital firms and their internationalization by focusing on such typologies. The study suggested that several gaps exist in the literature with regard to the definition of born digital firms and their internationalization processes. In this study, several research directions were proposed in order that further studies address these gaps.

The second study was a longitudinal single case, qualitative and interpretive in nature, in that it described the role played by e-entrepreneurs at recognizing international opportunities during the venture development stages. The study addressed the following research questions: “How and why do entrepreneur’s digital capabilities affect international opportunity recognition in a digital context? and “How is digital entrepreneurs’ decision-making logic applied in order to recognize international opportunities in a born digital firm?”. The study responded to calls of International and Digital Entrepreneurship research fields for advancing the drivers on born-digital start-up’ internationalization at individual level (Coviello, Kano and Liesch, 2017; Anderson and Evers, 2015; Mainela, Puhakka and Servais, 2014; Glavas, Mathews and Bianchi, 2017; Cahen and Borini, 2020). The study developed several propositions, employing the results of extant literature and discussing the role of e-entrepreneurs at recognizing international opportunities as a key driver following two dimensions: the digital capability-building approach (Nambisan, 2017; Kraus et al., 2019; Zaheer, Breyer, Dumay and, Enjeti, 2018; Dillon et al., 2020), and the decision-making logic underpinned by effectuation theories (Sarasvathy, 2001, 2008; Sarasvathy and Dew, 2005). It was argued that e-entrepreneurs developed a digital start-up mindset (Zaheer et al., 2018), and aggressively and actively explored new business opportunities in international target markets from the early stages of firm’s creation. Besides, the e-entrepreneurs developed experientially based digital competences during the start-up creation and launching processes in order to help alleviate liabilities of newness and foreignness (Dillon et al., 2020). It was also argued that the effectuation logic was the dominant path to decision-making in the context of uncertainty environments because it copes well in front of risky situations (Sarasvathy, 2001, 2008; Sarasvathy and Dew, 2005). The entrepreneurs demonstrated opportunity driven mindset, flexibility and means-driven actions. It was also argued that a direct lack of prior technical knowledge of several bottlenecks in the initial stages of the venture development force entrepreneurs to mainly act in effectual ways throughout market experimentation and learning by doing in incremental steps (Sarasvathy and Dew, 2005; Ojala et al., 2018). Finally, a model was made to illustrate that the interplay of entrepreneurs’ international vision, prior international experience and international experience acquired through the deployment of digital technologies relate to a better understanding to recognize international opportunities. This type of digital international experience was in the theoretical model a key digital capability forming part of the digital capability-building approach.

The third study was a conceptual paper aiming to develop a theoretical framework to relate digital business models and born digital firms' internationalization. It sought to answer the following research question of the dissertation: "How should a theoretical framework for a differentiated analysis of born digital firms' internationalization be set up according to digital business model dimensions?" Both methodologically and theoretically, this study addressed the gap between born digital firms' business models and their internationalization processes by integrating the literature on business models (BM) (Osterwalder et al., 2005; Osterwalder and Pigneur, 2010; Teece, 2010) with digital business models (DBMs) (Chesbrough 2010; Veit et al. 2014), specifically with the literature on DBMs theories and their impact on born digital firms' internationalization (Brouthers, Geisser, and Rothlauf, 2016; Ojala, Evers, and Rialp, 2018; Vadana, Torkkeli, Kuivalainen, and Saarenketo, 2019; Monaghan, Tippmann, and Coviello, 2020; Gabrielson, Fraccastoro, Ojala, and Rollins, 2021; Mac Cathmhaoil, Evers and Gliga, 2021). Against this backdrop, this study developed a typology of DBMs' dimensions and sub-constructs, which can be used to describe the digital scope of a BM. The study revealed that some salient factors on the three key-value dimensions of BM, namely, value proposition (e.g., digital offering), value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), and value capture (e.g., revenue models), play key roles in digital internationalization. On this theoretical basis provided, it was possible to develop a comprehensive understanding of how born digital companies are internationalizing and why their internationalization processes differ from each other attending their business model components. Generally, it refined and developed further research directions, thereby clarifying some of the constructs that can be utilized in the subsequent study.

The fourth, and last, paper was an inductive research approach, based on a qualitative multiple case study, and it addressed the following research questions of the dissertation: "How do digital business models' dimensions impact on international growth of born digital firms?", and "Why do some born digital firms internationalize faster than others in accordance with their digital business models' characteristics?" It attempted to examine which specific characteristics of DBMs among different typologies can enhance international growth of born digital firms by focusing on the theoretical framework developed in the third study. The results reveal that born digital firms need to be considered as forming a heterogeneous group regarding their internationalization. Although the impact of digital technologies to grow internationally is indubitable (Autio and Zander, 2016; Coviello et al., 2017; Monaghan et al., 2020), the concept of global business model based on uniformity that embodies the non-location-bound firm-specific advantages to be replicated (Tallman, Luo, and Buckley, 2018; Reuber et al., 2021), must be scrutinized carefully in a digital context. The findings demonstrated that born digital firms may face costs and challenges in dealing with local contexts in their internationalization (Verbeke and Hutzschenreuter, 2021), and, therefore, they are not inherently global (Stalkamp et al.,

2022; Rong et al., 2022). The results also accentuated the importance of digital platforms ecosystems integration in born digital firms' internationalization (Brouthers, et al., 2016; Ojala, Evers, and Rialp, 2018; Autio, Nambisan, Thomas, and Wright, 2018; Li et al., 2019). To realise the potential competitive benefits of FSAs in a new market, born digital firms often require access to local networks of external complementors (Li et al., 2019; Parente et al., 2018). This study pointed out that born digital firms' integration into digital platforms ecosystem allow them to internalize some barriers in entering foreign markets (Autio et al., 2018; Nambisan, 2017), and enhance their value co-creation (Sussan and Acts, 2017). Nevertheless, this study also highlighted that is crucial for born digital firms accurately estimate the extent to which the firm-specific advantages provided by digital technologies are both location and non-location-bound (Verbeke & Hutzschenreuter, 2021).

2. Theoretical Contributions

Overall, this doctoral dissertation contributes in several ways to the IB, IE, and DE research fields on born digital firms' internationalization by providing insights into the role played by entrepreneurs at recognizing international opportunities, and the role of DBMs' key-value dimensions on born digital firms' international growth.

First, it contributes to the development of definition and conceptualization of born digital companies, which increases research clarity within IB and IE. This study was conducted to close some of the gaps in the literature by analyzing several typologies of digital firms (e.g., platforms, web and mobile apps, e-commerce) and how such companies internationalize. In this thesis, born digital firms of purely digital goods and services, and firms involved in both digital and physical products and services distribution were included in the so-called born digital firms, (Brouthers, Geisser, and Rothlauf, 2016; Ojala, Evers, and Rialp, 2018; Vadana, Torkkeli, Kuivalainen, and Saarenketo, 2019; Monaghan et al., 2020; Gabrielson et al., 2021). According to the typology of digital internationalizing firms analyzed both in the literature review and the empirical cases, this study sheds some light in the underlying criteria that support born digital firm conceptualization in IB and IE research fields.

Second, this thesis reveals that born digital companies develop important distinctions regarding their entrepreneurs' digital capabilities to recognize international opportunities, which support and explain their distinctive internationalization processes. Entrepreneurs' capabilities to discover and create opportunities and their decision-making processes are argued as being central to understanding the firm's international growth (Mainela et al., 2014; Anderson and Evers, 2015). Nonetheless, extant IE literature has yet to systematically analyse how specific entrepreneur's capabilities are developed in a way to enable international opportunity recognition of born digital companies (Monaghan et al., 2020).

This research contributes by empirically confirming how digital technologies (e.g., through social media, AI, cloud computing platforms) create more variability in entrepreneurial activities and allow entrepreneurs to rapidly and easily enhance their capabilities and performance to enable a new venture to explore and exploit international opportunities in a digital context (Glavas, Mathews and Bianchi, 2017; Zaheer, Breyer, Dumay and, Enjeti, 2018; Dillon et al., 2020). In this context, this research underlines the potential to learn from Digital Entrepreneurship (Nambisan, 2017; Krauss et al., 2019) to revisit IE literature in allowing to better understand how digital artefacts and features influence internationalization possibilities and behaviours. Regarding the decision-making logic at recognizing international opportunities, this study reveals that the effectuation logic is the dominant path to decision-making in the key stages of venture development. By integrating insights from the effectuation theories and international opportunity recognition (IOR) with Digital Entrepreneurship (DE) literature (e.g., Sarasvathy et al., 2014), the study expands the effectual decision-making logic to digital entrepreneurial process by developing a theoretical model of IOR within a born digital firm.

Third, in order to be able to make sense of how DBMs' characteristics affect internationalization, this thesis develops a theoretical framework to clarify the conceptualization of BM due to the definitional ambiguity of BMs and DBMs within Information Systems (IS) literature. The study advances knowledge of how business modelling (Teece, 2010; Osterwalder and Pigneur, 2010) can be used in born digital firms, and to further identify the mechanisms that such companies employ to create and sustain their international growth. Thus, this study contributes to the main IE and IB theories on born digital firms' internationalization by integrating DBMs dimensions. This allows us to explain and predict critical aspects of the international strategies of born digital firms. Both the results of existing studies and this research support the fact that the key-value dimensions of DBM impact the international growth of born digital companies, and in turn, why some born digital firms internationalize faster than others. The results indicate the importance of an innovative digital value proposition, behavioural customer/market segmentation, the role of digital ecosystem for value creation, and the revenue model as a key component of digital value capture (Mac Cathmhaoil, et al., 2021; Reuber et al., 2021).

Finally, despite IE and IB literatures state "global business model" focuses on the uniformity of the firms' value proposition, value-creating and value-capturing mechanisms across foreign countries that facilitates replication (Reuber et al., 2021; Autio et al., 2021), this thesis reveals how born digital firms face some hurdles to cross-border transfer of their FSAs early on. Overall, born digital firms can be potentially powerful born-global whose expansion across geographical boundaries is facilitated by light assets and the low costs of extending online business models. Born digital companies aim "globalize" their DBM to cross-border transfer of their non-location bound FSAs from inception by integrating into digital platform ecosystems. It is crucial first-mover advantage (Chen, Shaheer, Yi, and Li, 2019) since leading firms capture a disproportionate share of the market during a short time span via network effects,

and this puts pressure on competing firms to engage in rapid internationalization. However, this thesis points out how born digital firms need to estimate the costs and difficulty of re-building the non-transferable ecosystem-specific advantages (ESAs) necessary to underpin a firm's business model in a foreign market (Li et al., 2019). We observed that born digital firms also face liabilities of ecosystem integration (LoEI) (Rong et al., 2022) associated with the costs and difficulty of rebuilding the non-transferable ecosystem-specific advantages.

According to the two divergent conceptualizations of born digital firms' internationalization postulated by IB and IE research fields, this thesis contributes to literature by examining the internationalization patterns among born digital firms in order to identify whether their internationalization paths differ or not from each other. Thus, this dissertation contributes to the new-born research stream of IE on digital business models (DBMs) by revealing how different typologies of born digital firms' business model are developed in a way to internationalize.

In sum, this dissertation responds to calls of IB, IE and DE research for advancing the drivers on born-digital start-ups' internationalization both at individual level (Glavas, Mathews and Bianchi, 2017; Nambisan, 2017; Krauss et al., 2019; Dillon et al., 2020) and at firm level (Brouthers, et al., 2016; Hazarbasanova, 2016; Yonatany, 2017; Strange and Zuchella, 2017; Witkop, et al., 2018; Hänninen, et al., 2018; Stalkamp, et al., 2022).

3. Managerial Implications

The results of this dissertation offer practical guidelines for e-entrepreneurs and managers of born digital ventures regarding their internationalization processes. The findings of the thesis have demonstrated that born digital firms have great difficulty to replicate a successful home-country business model overseas, and, therefore, these companies are not inherently global (Rong, Kang, and Williamson, 2022; Stalkamp et al., 2022). Although digital ICTs can enhance born digital firms' internationalization, this dissertation has demonstrated how such firms face critical factors, both technical (Ojala, Evers, and Rialp, 2018) and non-technical (Shaheer and Li, 2020; Wentrup, 2016, Stalkamp, et al., 2021), which come to limit the ability to exploit their digital resources globally. Based on DBMs' key-dimensions, we observed that most of the companies we studied organize their business around digital platform ecosystems to internalize some barriers in entering foreign markets (Autio et al., 2018; Nambisan, 2017), and enhance their value co-creation (Sussan and Acts, 2017). To realise the potential competitive benefits of FSAs in a new market, born digital firms often require access to local networks of external complementors (Li et al., 2019; Parente et al., 2018). Affiliation with digital platforms ecosystem can grant digital products/services global accessibility from inception with little or no barriers to entering

foreign markets (Autio et al., 2018; Nambisan, 2017). However, we observed that born digital firms also face liabilities of ecosystem integration (LoEI) (Rong et al., 2022) associated with the costs and difficulty of rebuilding the non-transferable ecosystem-specific advantages. According to this, e-entrepreneurs and managers should carefully consider the nature of their born digital firms' competitive advantages, and potential costs and challenges they are likely to face in replicating these advantages in host-country markets as they try to internationalize. Entrepreneurs and managers should evaluate the extent to which their efforts to internationalize are dependent upon the scalability of complementary non-digital resources and then address shortcomings in expertise through strategic alliances or proactive teams, that can provide the complementary resources needed to create and capture value in foreign countries.

Some e-entrepreneurs and/or managers are more likely to assume that the learning generated through virtual interactions obviates the need for learning about the target market. It may create a perception of reduced psychic distance in implementing internationalization strategies and it is likely to engender a "virtuality trap" (Yamin and Sinkovics, 2006). By focusing on the behavioural segmentation techniques, entrepreneurs and managers can identify customers/market preferences and behaviours to enable born digital companies to operate and grow internationally. Both psychographic and behavioural customers' segmentation help companies to develop a well-suited value proposition, and in some cases, to innovate new products or services by complementing the initial value offering. The implementation of digital technologies such as big data is crucial for customers' behavior segmentation.

Additionally, we acknowledge that in practice e-entrepreneurs are required to make favourable and knowledgeable decisions to facilitate international opportunity recognition and company performance. The inherent uncertainty present in the digital global market attempt entrepreneurs to exercise control over what can be done with available resources (effectuation rationality) rather than decide what ought to be done given a set of predictions about what happens next (predictive rational view). Our study outcome also highlights the entrepreneurs' level of knowledge acquired through the deployment of digital technologies during the initial phases of companies' creation as a key capability at recognizing international opportunities. In this manner, we acknowledge that the interplay of international vision and prior experience with the experientially based digital competences can enable entrepreneurs pursue international opportunities to a variety of markets at low costs and in less time. Such experientially based digital competences acquired by the e-entrepreneurs help alleviate liabilities of newness and foreignness (Glavas et al., 2017; Cahen and Borini, 2020; Dillon et al., 2020).

One of the challenges faces by born digital firms is the business' monetization from early stages of their development. Many of these digital businesses run at a loss for many years (Mac Cathmhaoil, Evers and Gliga, 2021; Stallkamp et al., 2022) confronting themselves what Gebauer et al. (2020 p. 314) refer to

as a “digitalization paradox,” in which value-generation is expedited through digitalization, but value-capture through revenue generation is elusive. These insights might indicate that born digital firms’ revenue model is a key area, strategically used for international growth and increased competitiveness. Thus, the value capture dimension is crucial for aggressive top-line expansion through international revenue generation. This is in line with prior studies indicating that a sound value proposition and a highly efficient value creation and delivery infrastructure are not sufficient for maintaining a profitable business in a sustainable way (Teece, 2010; Mac Cathmhaoil, Evers and Gliga, 2021).

4. Limitations and Suggestions for Future Research

This dissertation has several limitations. First of all, some limitations in the empirical studies are inherent to qualitative research methods which can provide potential future research avenues. The second study (chapter three) is based on material involving one company and therefore even if the research method applied makes it possible to collect in-depth data and to gain a detailed view of the case in question, in a single case study method over-generalization should be avoided. Regarding the fourth study (chapter five) most important is the degree to which the findings are generalizable across born digital firms’ BMs. This study was limited to four born digital firms located in Spain, and therefore, it is possible that research context has influenced their actions in developing BMs to internationalize. Nevertheless, born digital companies mostly varied by typology of DBM, industry, size, date of founding, and business stage. Further research could build and test propositions in the same industry and for different types of BMs, and, in turn, for the same typology of BMs across different contexts (e.g., market, industry). Moreover, future research in the form of longitudinal, cross-country, and cross-cultural studies is encouraged to confirm the conclusions of this thesis.

Secondly, there are also potentially insightful investigations to be developed involving born digital firms’ internationalization at the individual level. The importance of e-entrepreneurs and their key role in born digital firms’ competitive strategies and international expansion is also an important phenomenon that needs further research development. There seems to be little research on the role of entrepreneur’s digital capabilities and its key-role as a decision-maker in driving early and rapid internationalization. Future quantitative research on how entrepreneurs’ digital capabilities and their decision-making logic influences early internationalization would promote an understanding of born digital firms’ international growth.

Thirdly, in seeking to explain heterogeneity in the internationalization of born digital firms, we made several design decisions related to the three key-value dimensions of BM Canvas provided by Osterwalder and Pigneur (2010) that could be applied in a digital context. A differentiation in the value proposition, value creation and delivery, and value capture is recommendable as a framework for a

differentiation of internationalization strategies among different typologies of born digital firms. More empirical research is needed in order to clarify the role of digital BM's dimensions in IE literature. Further quantitative research needs to investigate other variables to be considered in the highly dynamic digital markets. In addition to the impacts of value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), the specific way of creating value and the individual customer interface used by a digital business play key roles in born digital firms' internationalization.

Fourth, according to the findings of this thesis, born digital internationalizing firms can develop their BMs at global scale by integrating into digital platforms ecosystems. The terms of platforms and ecosystems are gaining popularity, but sometimes their use lacks conceptual rigor (Zuchella, 2021). For future research, through robust conceptualization, the impact of digital platform ecosystem could be a promising avenue to inquire about the effective distinctiveness of this digital structure in comparison to other network structures already known. Further quantitative research would also be interesting to conduct quantitative surveys preferably with a longitudinal study approach that would allow for testing the generalizability of the findings. We call for more empirical research on the construction of measures of LoEI and exploration of cross-industry differences in internationalisation potential of born digital firms.

Finally, another important research direction suggested by our study, therefore, is the need to further explore the implications of on-line-offline integration activities and how this trend shapes firms' internationalization. Future research might also examine which specific digital ICTs allow scalability and replicability of DBM, since they could be crucial to enable born digital firms grow internationally. Little is known about how digital technologies can best be captured to support born digital firms' new digital product/services design and business model adaptation, and how users contribute to and shape the born digital firm in new markets.

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Publication 1

Digital Internationalizing Firms (DIF'S): A Systematic Literature Review and Future Research Agenda



**DIGITAL INTERNATIONALIZING FIRMS (DIF'S): A SYSTEMATIC
LITERATURE REVIEW AND FUTURE RESEARCH AGENDA**

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Abstract

This article analyzes the content and evolution of the research in the field of International Business and Entrepreneurship to describe the state of the art of the literature on born digital firms and their internationalization, to identify the themes that recurred during the last two decades, and to highlight trends and future research perspectives in these fields. We conducted a rigorous search of articles published in high impact journals. The main findings reveal that there is still no consensus on the definition of digital firms and their internationalization processes. Future research should advance in this aspect. Likewise, it is both needed and important to conduct more empirical research that analyze the international expansion of born digital firms and their internationalization patterns. In response to this, we examine in the extant literature how mainly digital companies base on their digital business models to internationalize. Although there are still few academic publications regarding how digitalization of the business model affects born digital firms' internationalization, the number of articles is widely increasing in the field of International Business and Entrepreneurship, as are opportunities for future research.