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Digitalisation and Internationalisation in SMEs: A Systematic Review and Research Agenda

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Digitalisation and Internationalisation in SMEs: A Systematic Review and Research Agenda

Abstract

Purpose – The purpose of this paper is to provide an integrative picture of the state of the art of the literature on digitalisation of small and medium-sized enterprises (SMEs) as an enabler for their internationalisation process and as a comprehensive view of the specific domains impacted by digital technologies as well as their repercussions on the international outreach.

Design/methodology/approach – A systematic review which leverages a descriptive analysis of extant literature and an axial coding technique has been conducted to shed light on the current knowledge and to identify primary research areas and future research lines.

Findings – The research indicates that digitalisation impacts the internationalization of SMEs in three specific domains: a) internationalization through the adoption of ICT technologies and e-commerce platforms; b) international expansion through the digitalisation of value chain activities; and c) international outreach through knowledge acquisition on digital platforms.

Originality – The value of this study is threefold. First, we attempt to systematically review the literature on SMEs digitalization and internationalization and provide a holistic perspective on the intertwining of these two research streams. Second, we propose a novel conceptualization on the dimensions of SMEs digitalization as enablers to internationalization. Third, we put forward promising future lines of research.

1. Introduction

The relevance of small- and medium-sized enterprises (SMEs) has been extensively analysed in the academic literature (Juergensen et al., 2020; Robu, 2013; Wright et al., 2007). This literature stream has not only addressed the role of SMEs as contributors to a nation's

economic growth (Abbasi et al., 2021), but also as pioneers in the adoption of new technologies, production processes or business models to face global competition (Juergensen et al., 2020). SMEs now face the necessity to undertake a digital transformation (Dam et al., 2019; Pelletier and Cloutier, 2019; Ulas, 2019) in order to catch new growth opportunities and cope with new challenges in domestic and international markets (Jafari-Sadeghi et al., 2019; Hervé et al., 2020). Academic literature commonly investigates digitalisation and internationalisation of SMEs as separate dimensions (Bouwman et al., 2019; Louw and Nieuwenhuizen, 2020). In fact, International Business (IB) scholars have analysed the internationalisation paths of SMEs by proposing different approaches that focus on the processes that lead to the outreach of new markets. While in the domain of digital entrepreneurship, academics have highlighted that SMEs have started to adopt digital tools to capture the necessary market knowledge and commitment described by internationalisation theorists.

Building on those streams of research, we posit that digitalization plays a key role in fostering knowledge acquisition processes, ultimately easing the internationalisation of SMEs. Past research has focused its attention on the degree to which SMEs have adopted information and communications technology infrastructures (ICT) or how digital technologies have changed the interaction between activities in the value chain of SMEs, resulting in the adoption of new business models (de Perea et al., 2019; Magnani et al., 2021; Bivona and Cruz, 2021). However, literature delving into the role of digitalisation as an enabler to SME internationalisation remains fragmented (Cassetta et al., 2020; Kergroach, 2020; H.-J. Lee, 2015). Henceforth the need to systematically review what has been said on the intertwining of these two research fields and the necessity to propose new promising research avenues.

From a practical perspective, while digitalisation and internationalisation are connected to business model scalability (Bargoni et al., 2023; Cassetta et al., 2020; Stallkamp and Schotter, 2021), many SMEs are unable to digitally internationalise because they are not designed -in the early stages of their existence- to scale this way (Bailetti and Tanev, 2020; Westerlund, 2020). Either due to a scarcity of financial resources or the liability of newness and smallness (Eggers, 2020; Freeman et al., 1983; Schweizer, 2013). Even though small businesses arguably have advantages over traditional ones in terms of advancing digitalisation, many scholars have underlined that academic research on the use of

digitalisation by SMEs to internationalise remains scant (Jean and Kim, 2020; Joensuu-Salo et al., 2018; Knight and Liesch, 2016; Sinkovics et al., 2013; Wittkop et al., 2018).

In fact, there is evidence suggesting that digitalisation is more than a propeller for SMEs' internationalisation (Vadana et al., 2019). It represents a pivotal strategy that allows companies to build new strategic capabilities (Nambisan, 2017; Wentrup, 2016). In the words of Vadana (2019, p.2) '*existing research has largely neglected digital technology's role in companies' internationalization pursuits, because this subject is novel and information is lacking.*' Against this background, this paper aims to answer two specific research questions:

RQ 1 What are the main contributions of the role of digitalisation for SME internationalisation?

RQ 2 In the light of disruptive digital technologies, what are the most promising future lines of research on the intertwining between digitalisation and internationalisation in SMEs?

To answer our research questions, we conducted a systematic literature review (SLR; Kraus, Breier and Dasí-Rodríguez, 2020; Kraus et al., 2021; Robledo et al., 2021). First, we present the theoretical background on the internationalisation and digitalisation of SMEs. Then, we provide a conceptualisation of the systematic review with the aim of contextualising the topic and to map the literature and its evolution (Cadavid Higuaita et al., 2012; Cancino et al., 2017). Furthermore, leveraging axial coding techniques to merge labels and concepts, we identify current research areas and possible future research avenues. The findings from the content analysis have been grouped and discussed following three research streams. The first stream investigates the types of resources related to ICT that influence the internationalisation process of SMEs with a focus on the role of infrastructures and digital platforms. The second stream is focussed on the impact of digitalisation on the activities of the SMEs' value chain to increase their internationalisation. In this section, we aim to provide a holistic perspective on how digital technologies enable SMEs to reconfigure value chain activities and the impact on their internationalisation process. We emphasise how the integration of digital technologies into SMEs value chains allows small companies to access and elaborate upon a large amount of data. This leads to a wider opportunity recognition, to an innovative approach to exploit opportunities, to be instantaneously operational on an international scale, or to compete on the same level as multinational companies. The third section explores the relationship between digitalisation and cross-border knowledge

acquisition as a means for internationalisation. In this section we elaborate on the role of digital technologies in enabling companies to access external knowledge and build their internationalisation strategies.

The contribution of this paper to the extant literature is threefold. First, the study sheds light on the role of ICT in lowering the cost of internationalisation for SMEs. Findings show that through digital platforms, SMEs could compete at the same level as multinational companies while enduring lower costs of expansion (Barroso et al., 2019; Houghton and Winklhofer, 2004; Tolstoy et al., 2020). Second, we provide a holistic perspective on the role of digitalisation on value chain activities to foster cross-border expansion. We contribute to the existing literature by highlighting how digital servitisation processes could support SMEs offerings while production facilities are delocalised to ecosystems in which there is greater technological advancement (Zahoor et al., 2023b; Afrifa et al., 2022; Coviello et al., 2017; Gruber, 2019; Strange and Zucchella, 2017). Third, the study adds to the body of literature on IB (Fletcher and Harris, 2012; Morgan-Thomas and Jones, 2009; Sinkovics et al., 2013) by proposing digitalisation as a knowledge acquisition phenomenon to foster internationalisation processes in SMEs (for example, market-specific knowledge acquisition through digital platforms). Fourth, findings suggest that the speed of international expansion is facilitated by the knowledge acquisition process which is fostered by digital platforms that allow SMEs to enhance the learning processes related to international markets through immediate access to relevant information (Mathews and Healy, 2008; Morgan-Thomas and Jones, 2009). Finally, the paper constitutes a guideline for conducting future research on the intersection between these two research streams.

2. Theoretical background

2.1. Internationalisation processes of SMEs

Academics have long analysed the topic of internationalisation of SMEs by delving into the processes that facilitate an outreach to cross-board markets and the necessity to compete in international competitive arenas (Dabić et al., 2020; Johanson and Vahlne, 2017). The theories of IB find their forefather in the Stage Model Approach theorised by Johanson and Vahlne in 1977. The authors considers internationalisation as the product of a series of incremental decisions, making it a process of incremental adjustments to changing

conditions of the firm and its environment. A key element in the Stage Model Approach is the concept of experiential knowledge. This construct provides the framework for perceiving and formulating opportunities which, in combination with the commitment of resources, are the factors that influence engagement decisions and ongoing business activities in foreign markets (Li et al., 2004). Although the Stage Model Approach has been recognised for many years as a fundamental theory in IB, it has been criticised by the scientific community. The evolution of the theoretical landscape on the internationalisation of SMEs has brought to light that this process occurs in markets that are more and more perceived as networks of relationships (Singh et al., 2022; Cenamor et al., 2019; Street and Cameron, 2007) and in which internationalisation does not follow the classical incremental approach originally theorised by Johanson and Vahlne (Kahiya, 2020; Knight and Liesch, 2016; Paul, 2020; Roque et al., 2019; Welch and Paavilainen-Mäntymäki, 2014).

The increasing need to find new models to explain the internationalisation process applicable to small- and medium-sized companies has led the scientific community to develop the concept of International Entrepreneurship (IE, D. Fletcher, 2004; Liñán et al., 2019; Williams and Spielmann, 2019; Zahra et al., 2005; Gavrilă Gavrilă and de Lucas, 2021). This construct shifts from staged or planned views of the internationalisation process to a more processual or learning approach. The learning approach of the internationalisation models proposed in the field of IE brings to light the role of the Internet as a source of specific and general knowledge on a foreign market (Sinkovics et al., 2013). Extant literature proposes that SME's ability to engage in outside domestic markets can be enhanced through the implementation of a digital transformation, resulting in a more prone approach to innovation adoption (Knight and Liesch, 2016). In fact, the ability to engage in an internationalisation process through the implementation of a digital transformation allows SMEs to quickly gather information on foreign markets (Lohrke et al., 2006) in order to achieve their international objectives, thereby making the IE approach more leveraged than the traditional IB theories and provide a central role for knowledge management practices within the firm.

Academics have presented various interpretations of knowledge management (KM). Beckman (1999) defined KM as the formalization of access to experiences, knowledge, and expertise, leading to the development of new dynamic capabilities, increased performance, and enhanced customer value. Similarly, Chow et al. (2005) characterized KM as a set of

activities that concur in the creation, storage, dissemination, and implementation of knowledge within organizations. Gloet and Terziovski (2004) noted that KM practices are highly subjective and subject to diverse interpretations. Furthermore, Rastogi (2000) argued that KM "is an integrated and systematic approach to coordinate organizational activities such as creating, acquiring, storing, sharing, utilizing, and deploying knowledge to pursue significant organizational objectives" (p. 22).

Therefore, building on the KM definitions proposed by Beckman (1999) and Rastogi (2000), this study regards KM as a fundamental and crucial element that underpins various aspects of performance enhancement, including innovation, increased efficiency, and the attainment of sustainable competitive advantages for firms. Consequently, aligned with the objectives of this study, it aims to enhance our comprehension of the role of KM processes and systems by examining how KM practices moderate the impact of firm-level innovation on the performance of internationalized firms. It demonstrates that robust KM practices within a firm can amplify the positive effects of innovation on performance.

Indeed, in today's rapidly evolving global business arenas, competition is shifting towards knowledge-based competition at a swift pace. This transition is accompanied by a rapid transformation in technology and a shift in the sources of value creation from tangible assets to intangible resources, with a primary focus on knowledge-based elements (Andersson et al., 2016). According to a meta-analysis by Andersson et al. (2016), IB research is increasingly emphasizing the emergence of new sources of value creation, such as firms' innovation and knowledge. This underscores the pivotal role of knowledge and knowledge-related components in the internationalization and digitalization of SMEs.

As emphasized, the learning and knowledge elements within internationalized firms are central to the causes, progression, and outcomes of internationalization (De Clercq et al., 2012). The ability to acquire and harness new knowledge is of paramount importance and necessitates a structured system for transferring and sharing knowledge among individuals within firms while encouraging effective implementation (Assaf et al., 2012). Consequently, digitalization plays a pivotal role in fostering internal knowledge sharing, due to the advancements in the digitally enabled communications. Knowledge, whether tacit or explicit, is recognized as a critical factor in achieving efficient coordination within internationalized organizations (e.g., Michailova and Minbaeva, 2012; Pla-Barber and Alegre, 2014). Accordingly, firms with robust KM practices are proficient in sharing,

organizing, and leveraging knowledge, thereby enhancing their capacity to translate innovation into improved performance.

Furthermore, the Resource-Based View (RBV) underscores the criticality of firms' KM practices and capabilities. According to the RBV perspective, knowledge represents a vital strategic intangible resource that underpins a firm's long-term sustainability and success due to its inherent value, uniqueness, and difficulty of imitation (Grant, 1991). In line with this perspective, KM practices enable firms to acquire and create additional value by harnessing the intellectual capacities of their employees (Gold et al., 2001; Chen and Huang, 2009). Certainly, firms' knowledge management (KM) can be characterized as their capacity to identify, structure, and apply resources rooted in knowledge management principles in conjunction with other essential capabilities and critical assets. This capacity serves as a framework that empowers managers to enhance and cultivate their organizational competencies, ultimately leading to heightened innovation and superior performance in international markets (Darroch, 2005).

In accordance with the knowledge-based view (KBV), scholars have posited that variations in firms' performance can be attributed to disparities in their knowledge assets, knowledge processing mechanisms (both human and computer-based), and knowledge practices (Holsapple and Wu, 2011). As articulated by Holsapple and Wu (2011), successful firms consciously oversee their knowledge resources and devise KM practices geared towards creating value and enhancing performance. Consequently, a company's performance hinges on the well-structured innovation process, with effectiveness reaching its zenith when firms possess abundant and adeptly managed knowledge resources. The existing knowledge within a firm, coupled with its continuous process of acquiring, sharing, and transferring new knowledge, serves as a catalyst for more effectively harnessing innovation capabilities and attaining superior performance.

In conclusion, this perspective has introduced the role of knowledge acquisition relative to a foreign market as a propeller for internationalisation. Academics have underpinned how the digitalisation of SMEs has taken a central role in their internationalisation processes as it represents a medium by which to acquire knowledge about foreign markets (Bai et al., 2021; M. Fletcher et al., 2013; Johanson and Vahlne, 2017; Zahoor and Al-Tabbaa, 2021).

2.2. Digitalisation processes of SMEs

Since the advent of the digital era and the Internet in the late 1990s, companies across all industries have undergone a process of discovering and adopting new digital technologies (Cassetta et al., 2020) in order to exploit their benefits (Matt et al., 2015). Digital transformation is having a large impact on companies (Garzoni et al., 2020). For example, social media is reshaping the interactions between companies and customers (Rakshit et al., 2021). Moreover, the opportunity represented by digital platforms and e-commerce boosted a new internationalisation model by changing the cost structure of the marketing divisions of many firms (Bouwman et al., 2019; Saura et al., 2021).

Extant literature on Information Systems pinpoints that the initial wave of this transformation commenced in the early 21st century with the emergence of Web 2.0 technologies (Autio, 2017; Bell and Loane 2010). Subsequent significant developments included the introduction of mobile operating systems (e.g., smartphones), the advent of storage solutions on computer servers (e.g., cloud computing), the proliferation of learning algorithms (e.g., ChatGPT), and the rise of big data technologies. All these innovations relied heavily on data, making its collection and analysis more accessible for the development of user-centric and knowledge-driven products and services (Bargoni et al., 2023).

Digital technologies have now found applications in optimizing production and distribution processes (e.g. artificial intelligence), enhancing managerial decision-making for market entry, targeting new customers more effectively, selecting relevant partners, bolstering advertising strategies, making more informed pricing decisions, and predicting demand (Kraus et al., 2019b; Aagaard et al., 2019; Watson et al., 2018; Bargoni et al. 2023). The Internet of Things (IoT), which entails the integration of sensors capable of collecting and processing data into smart products and devices, enabling them to communicate and interact with one another has also propelled industrial advancement (Rüßmann et al., 2015). Finally, firms have recognized new prospects with blockchain technology, characterized as "an open, distributed ledger that records transactions between two parties efficiently and in a verifiable and permanent way" (Iansiti & Lakhani, 2017). These ledger technologies offer firms new secure and third-party-free information storage and transmission based on code.

Thanks to these recent technological advances, potent information processing and storage resources are now widely accessible. On one hand, it enriches interactions among

individuals, and on the other, it opens up opportunities to enhance value creation. Companies must undergo a transformation across their entire organization and activities to recognize and leverage these opportunities (Kraus et al., 2019b; Matt et al., 2015; Porter & Heppelmann, 2015). Moreover, because digital technologies impact companies at various levels, encompassing creation, production, sales and marketing, delivery, and support, they also entail disruptive changes in the value chain (Porter & Heppelmann, 2015).

Ross and colleagues (2017) delineated two distinct phases in this transformation: becoming digitized and becoming digital. The first phase occurs at the operational level and involves standardizing business processes and optimizing operations through the implementation of technologies and software. The second phase revolves around the utilization of purely digital technologies to articulate, target, and personalize alternative offerings, ultimately defining a new value proposition. Thus, a company becomes truly digital by seizing the opportunity to redefine its business model and activities (Aagaard et al., 2019; Kraus et al., 2019b; Ross et al., 2017).

Extant theories prove that digital transformation strategies have common elements which are unrelated to the industry in which a company operates (i.e., these strategies are not industry or sector specific) but that can be related to four different characteristics (Matt et al., 2015). Following Matt et al.'s (2015) classification, the first characteristic is the use of technologies that relate to the learning process and adoption of IT infrastructures. The authors infer that the degree to which a company exploits new technologies is related to the degree to which the company wants to become a technological market leader in its own industry. Academics have inferred that becoming a technological leader is not only a source of competitive advantage for the company but also implies changes in the value chain activities and in the value creation process (Jafari-Sadeghi et al., 2021; Nguyen et al., 2015). In fact, the second characteristic is a change in value creation which implies that digital transformation has a direct impact on the value chain of the companies. This impact is either because the company has adopted new technologies in its operations (De Valon et al., 2022; Thomé et al., 2016), and thus has changed or digitalised the organisational processes and activities, or because the company has introduced digital elements into its products and, as a consequence, has had a product-related digital transformation. In accordance with Matt's vision, academics theorise that changes in the value-creating activities brings forward the third characteristic, which is structural changes (Chen, 2019; Garzoni et al., 2020). These changes occur in the

organisation because they are a consequence of the changes in the operation of the company or, even more radically, in the business model of the company. Thrassou et al. (2020) proposed that the financial aspects of digitalisation can simultaneously be a driver for transformation and a bounding force for SMEs. The fourth characteristic is that SMEs need to have proper financial capabilities to undergo a digital transformation and sustain capital expenditures. These authors also theorised that the financial aspects of digitalisation represent a bounding force if the capabilities of the company are not sufficient to sustain this transformation.

We can infer that there are several factors that still prevent SMEs from adopting a digital transformation approach in the context of both developed countries and emerging ones (Razavi Hajiagha et al., 2022). First, extant theoretical constructs (Gruber, 2019; Westerlund, 2020) highlight that SMEs are less exposed to the need for digitalisation and tend to conduct business as usual. Second, the lack of competences and resources prevents the adoption of new technologies (Louw and Nieuwenhuizen, 2020). Third, SMEs tend to adopt a digital transformation process in a much slower way than do big companies (L. Li et al., 2004). Finally, the investments required by the digital transformation process of SMEs are often related to their financial performance, and excess resources are not usually used in this process (Y. Lee and Colarelli O'Connor, 2003).

In conclusion, digital transformation is strictly related to the corporate strategy decisions of a company (Assar and Hafsi, 2019; Bouncken et al., 2019; Kraus et al., 2019a; Matt et al., 2015; Niemand et al., 2020; Ziyadin et al., 2019). Academics pinpoint that digitalisation and internationalisation within SMEs is connected to knowledge acquisition processes, value chain activities configuration, business model scalability and the use of ICT infrastructures and digital platforms (Caputo et al., 2022; Scuotto et al., 2020; Cassetta et al., 2020; Stallkamp and Schotter, 2021). Against this theoretical background, we propose a systematic literature review on the topic to provide a holistic perspective on what has been found and what still can be researched in the intertwining of digitalisation and internationalisation in SMEs.

3. Methodology

3.1. Research design

A systematic literature review (SLR) is a methodology that is primarily used in business and management sciences today (Bouncken et al., 2015; Kraus, Breier and Dasí-Rodríguez, 2020; Leonidou et al., 2018). SLR is often in contrast with traditional narrative reviews because of its objective, replicable, systematic and comprehensive nature (Parris and Peachey, 2013). It is a valid research method as it tries to minimise the biases in searching, appraising and synthesising relevant studies on a specific topic (Kraus et al., 2021; Mulrow and Cook, 1998). In conducting our research, SLR was applied in order to fully answer our research questions and highlight future topics for analysis (Webster and Watson, 2002).

The first phase of the analysis mapped the state of the art of the literature in this field by means of an examination of articles, authors and journals (Cadavid Higueta et al., 2012; Cancino et al., 2017). This analysis is a well-established method for quantitatively studying science and evaluating scientific publications in a specific research area and for a specific period of time (Massaro et al., 2016; Thelwall, 2008).

In the second phase, a content analysis of the literature was conducted through a one-to-one screening of each paper by at least two of the authors independently. In this phase, the first open coding techniques (Strauss and Corbin, 1990) were applied to categorise the main findings and insights emerging from the articles which were relevant to the scope of the research. By leveraging axial coding techniques (Bell et al., 2018), it was possible to merge labels and concepts and identify the primary research areas that have been investigated by scholars to date. In this way, it was possible to answer RQ2.

In the third phase, future research lines were identified and discussed based on the information retrieved through data extraction and the descriptive and thematic analysis (Carvalho et al., 2013; Takey and de Carvalho, 2015).

3.2. Search strategy and data extraction

The databases selected were the Thomson Reuters Web of Science Core Collections (WoS), also known as the ISI Web of Knowledge, and Scopus. The reason for the selection of these databases is access to different types of documents, such as articles, book reviews and editorials, which are indexed in the prestigious Journal Citation Report (JCR).

3.3. Data extraction

Data extraction consisted in the formulation of the search strings. The keywords of ‘digitalisation’ OR ‘digital transformation’ OR ‘digital technologies’ OR ‘ICT’ OR ‘big data’ OR ‘IoT’ AND ‘internationalization’ OR ‘internationalisation’ OR ‘international growth’ OR ‘international expansion’ AND ‘SMEs’ OR ‘small medium enterprise*’ were used in order to include all possible relevant results in terms of articles, paper titles and abstracts (Street and Cameron, 2007). The Boolean operator OR enabled the retrieval of documents using both terms, while the AND operator enabled a search for the combination of the terms. Inclusion and exclusion criteria were then applied as discussed in the following section.

3.4. Inclusion and exclusion criteria

Research in the databases was refined in order to select only the relevant articles in the SLR, with filters for year, language (English only) and document type (scientific articles) applied (Cancino et al., 2017; Merigó et al., 2015).

In the initial selection of articles, no time limits were applied, and articles that were written up to 2023 were considered. Second, only articles included in the ‘Management’ and ‘Business’ fields were considered. Third, only articles and documents written in English were considered due to language limitations of the authors (Vrontis and Christofi, 2021). Finally, only peer-reviewed articles published in academic journals were considered (Webster and Watson, 2002).

By leveraging the Clarivate Analytics’ Journal Citation Report (JCR), a comparative table (Table I) was developed using three leading international rankings: German Academic Association for Business Research (VHB-JQ3), the Academic Journal Guide (ABS) from the United Kingdom and the JCR Impact Factor (IF; Bouncken et al., 2015; Kraus, Breier and Dasí-Rodríguez et al., 2020). Following Chatterjee et al. (2021) methodological approach and to systematically review the most impactful literature on the topic, only the studies published in journals with an ABS rating of 3, which is equal to an impact factor equal or higher than 2.5, and a VHB-JQ3 B rating were selected.

Using the following criteria, a descriptive analysis was also conducted to avoid problems in comparing the metrics of scholars or journals from different research fields.

[Insert Table I near here]

Finally, as suggested by Jalali and Wohlin (2012), snowballing was conducted (i.e., the process of pursuing the references of references), duplicates were removed so the sample was refined and, finally, only papers published in top-tier peer-reviewed journals were considered.

These inclusion criteria led to a sample with 46 results (Figure 1). We acknowledge the small number of articles that compose the dataset of this SLR due to the specificity of the level of analysis and, hence, the specific impact on SMEs of the intertwining of two mature fields: digital transformation as a means for SME internationalisation (Frank and Hatak, 2014; Kraus, Breier and Dasí-Rodríguez, 2020). As suggested by Bretas and Alon (2021), great importance has been given to the analysis of the concepts of the papers in the dataset given the theory development objective of this systematic literature review in order to identify constructs and make comparisons focussed on the research on theory development in the most objective way (Kraus, Breier and Dasí-Rodríguez, 2020).

The antecedent, process and outcome variables were then independently classified into conceptual groups (for example, ‘digital transformation and export management’, ‘digitalisation and capabilities’) using Krippendorff’s (1980) content analysis strategy. Differences between the sets of classifications were discussed until we were satisfied that each grouping was as distinct and orthogonal as possible. The next section reports the results of this analysis.

[Insert Figure 1 near here]

3.5. Descriptive analysis of the systematic literature review

The objective of an SLR is to highlight what has been said in a certain research field by leveraging the theories and constructs of authors who, in some cases, might have different backgrounds or come from different fields (Frank and Hatak, 2014; Kraus, Breier and Dasí-Rodríguez, 2020). The results of the SLR are described in order to provide a holistic view on the architectural design of the field in terms of articles published, journals and authors.

In addition, RQ1 will be answered.

An analysis has been performed in terms of publications over time, the relevance of the articles, authors' impact, journal outlets and citation impact (Vrontis and Christofi, 2021). This analysis of the existing literature represents a preliminary map of the research in the field (Armitage and Keeble-Allen, 2008; Frank and Hatak, 2014; Robledo et al., 2021) and identifies possible gaps to be filled by future research (Kraus Breier and Dasí-Rodríguez, 2020; Kraus et al., 2021; Tranfield et al., 2003).

As depicted in Figure 2, the analysis shows four distinct phases in publication trend. A first phase, from 1990, the year of the first publication on the topic of digitalisation of SMEs as an enabler for internationalisation, until 2000, where the number of publications remained flat (13% of total publications published in that year range). A second phase, from 2001 to 2010, where an empirical observation of the selected articles shows an increasing number of publications on the topic (22% of total publications published in that year range). In this phase we assist to a conceptualization of the phenomenon (40% of papers are conceptual). A third phase, from 2011 to 2021, where the number of published papers has steeply grown (46% of papers published in that year range) and so the number of empirical papers (75% of papers are empirical). A fourth phase, that begins in 2022 and is ongoing, where already 20% of the selected papers have been published, highlighting the centrality of the topic for the academic community.

[Insert Figure 2 near here]

3.6. Relevance of the articles

A quantitative parameter was used to assess which articles were the most prominent in the field: the number of citations received (Merigó et al., 2015). This parameter was extracted from Google Scholar, a prominent research database which is widely used in the social science field (Serenko and Bontis, 2017).

Table II represents the 10 articles that received the most citations and the average number of citations per year (TC/Y). The most cited article was written in 1999 by Coviello and McAuley, in which the authors tried to summarise what has been written in the field of internationalisation of smaller firms in the context of foreign direct investments to explain the relationship between smaller firm internationalisation and innovation as factors

determining this relationship. Other relevant studies (Jie et al., 2021; Weerawardena et al., 2007) have confirmed that internationalisation enhances a firm's capacity to improve performance through innovation and the building of dynamic capabilities which happens through knowledge building in specific markets. Innovative ability and the use of Internet and digital infrastructures was studied by Nassimbeni (2001), who was the first to analyse on the basis of an empirical investigation how exporters and non-exporters compared in terms of technology and ability to innovate.

[Insert Table II near her]

3.7. Journal outlets and citation impacts

The majority of the articles were published in the *International Marketing Review* (n=11, 24%) which represents the most relevant journal on international marketing topics (Table III). *International Small Business Journal* (n=10, 22%) appears to be in second place, followed by articles published by the *Journal of Business Research* (n=7, 15%). The rest of the articles were derived from different journals related to both international management and small business. According to ABS classification, most articles came from the IB area, and this means that digitalisation has different impacts on the internationalisation processes of firms.

The analysis of the literature shows that out of the 163 authors considered in the dataset, only 8 have written more than once on the topic of digitalization related to the internationalization process of the SMEs (Table IV). This shows that productivity per each author around the topic is quite low and we can infer that few specialized authors addressed the topic. This brief analysis should encourage authors to further deepen the literature and academic research around the topic. The analysis of the citations per outlet permitted to deepen the academic literature identifying the need for scholars to build new frameworks on the topic of digitalization and internationalization of SMEs (Table IV). The most-cited article was published in *Management International Review*, with a total of 1,711 citations. This article by Coviello et al. (1999) represents a milestone in the field by reviewing and assessing empirical research on the internationalisation of smaller firms in the context of Foreign Direct Investment theory, the 'stage' models of internationalisation and the network perspective. The article contributed to overcoming the staged model approach to

internationalisation and proposed that firms may incrementally internationalise their operations which encompasses both internalisation and externalisation of activities.

The analysis of the most prominent works on the role of digital technologies as enablers for internationalisation in SMEs has brought forward three main dimensions of research. First, there is a need to understand the role of ICT infrastructures and Digital Platform ICT in helping SMEs to reduce the cost of internationalisation. Second, there is a need to understand the impact of digitalisation in SMEs on value chain activities, and third, the role of digitalisation as a means to gain knowledge of foreign markets needs to be understood.

[Insert Table III near here]

[Insert Table IV near here]

4. Thematic analysis of the literature

The results of the SLR and the discussion of the topic have been divided into three sections. The first section discusses the impact of digital technologies and ICT infrastructure on the internationalisation process of SMEs. The second section examines the impact of digitalisation on the value chain activities of SMEs and its implications for internationalisation. The third section explores the role of digitalisation as a cross-border knowledge acquisition medium and its impact on the internationalisation of SMEs.

4.1. Internationalisation of SMEs through digital technologies: The role of ICT and digital platforms

The advancement in ICTs and the common use of the Internet have helped firms to generate new opportunities to leverage their information-processing capabilities and global connectivity potential (Hagsten and Kotnik, 2017; Sinkovics et al., 2013). For SMEs, the rise of digital technologies has produced new opportunities in the field of export marketing (Vadana et al., 2020), rapid internationalisation opportunities and virtual customer servicing as a result of the exposure to a large amount of structured or semi-structured datasets on foreign markets (Jafari-Sadeghi et al., 2018; Bertello et al., 2020).

The analysis of the extant literature in the field highlighted how ICT plays a major role in the internationalisation process of SMEs (Hagsten and Kotnik, 2017). The cost of internationalisation for most SMEs would be unbearable in a fully “physical” process. Digitalisation has allowed SMEs to overcome capital expenditures which are necessary, for example, to open operational branches abroad or new points of sale in the targeted countries or even to establish costly distribution networks.

The developments made in recent years in ICT infrastructures has also had positive effects on the quality of SMEs production (Cardona et al., 2013). It has enabled small firms to find new digital distribution strategies (digital platforms) or to reduce distances and entry-related costs in foreign markets (Guercini et al., 2020; Jin and Hurd, 2018; Lohrke et al., 2006; Morgan-Thomas and Jones, 2009). Scholars have stressed how strong the use of e-commerce could be as a mean for international expansion (Samiee, 1998; Tolstoy et al., 2020) and how e-commerce can enable SMEs to compete at the same level as multinational companies (Martínez-Martínez et al. 2022, Hamill and Gregory, 1997; Houghton and Winklhofer, 2004; Masroor and Asim, 2019; Prasanna et al., 2019) but endure lower costs of expansion. SMEs that rely on distribution channels with many intermediaries to reach foreign markets face a higher complexity of operations management and higher costs of internationalisation. This can be drastically reduced by the adoption of ICT infrastructures and e-commerce platforms (Holland and Gutiérrez-Leefmans, 2018; Houghton and Winklhofer, 2004).

Following Morgan-Thomas and Jones’ classification (2009), four types of resources related to ICTs influence the internationalisation process of SMEs: (1) online resources related to being present online through a website that enables a company to share information and to communicate with customers; (2) online transactions (e.g., e-commerce platforms) that facilitate economic exchanges between buyers and sellers, like customer ordering and payment, which reduce transaction costs and intermediary-related costs; (3) complementary ICT resources as a proportion of Internet-enabled activities of the firm; for example, ICTs can be used to efficiently predict foreign demand by fulfilling a number of marketing tasks, such as international advertising, promotions, communication and order management, and to create predictive models; and (4) ICT-schooled human capital, that is, human capital resources as the proportion of employees with post-upper secondary ICT education compared to the total number of employees. The view of Morgan-Thomas and Jones (2009) is corroborated by other academics (Cassetta et al., 2020; Vadana et al., 2019; Zahoor and

Lew, 2023) that have proven the positive relationship between ICT and the exporting activities of SMEs. This indicates that even the adoption of a website, which is a basic tool in the ICT range of digital technologies, can help companies to reach international markets with a lower costs of entry (Hagsten and Kotnik, 2017). There is also a positive relationship between ICT capacities of employees (i.e., their ability to develop ICT/digital technology strategies) and the speed of internationalisation of SMEs (Ashurst et al., 2012; Hagsten and Kotnik, 2017). Moreover, SMEs often find it difficult to compete in markets with a high competitive pressure and a dynamic environment (Chan et al., 2019). Extant research in the field shows that leveraging their business capabilities and strategies, SMEs use digital platforms to distribute, edit and homogenise data on a large scale in order to build competitive advantages with respect to larger companies (Cenamor et al., 2019).

Digital platforms are disrupting the way SMEs operate and are changing the “business as usual” paradigm by offering digital tools (software or hardware) to build modular architectures (i.e., that include core and replaceable modules) that are scalable and agile in their evolutionary ability (de Reuver et al., 2018; McIntyre and Srinivasan, 2017; Tiwana, 2015; Wareham et al., 2014). This integration of digital platforms in SME operations has led to an advancement in the collection and usage of data which enables firms to create digital networks to conquer new international markets by leveraging unique resources while reshaping their business models (McAfee et al., 2012; Van Alstyne et al., 2016). The shifting market dynamics and the rising influence of digitalisation has led SMEs to innovate their business models and to benefit from their competences in ecosystems in which they can successfully manage digital transformation (Ferreira et al., 2023; Gierlich et al., 2019).

In conclusion, digital technologies are the enablers of the development of network capabilities, which are dynamic capabilities, and therefore, we can infer, following strategic management literature, that network capabilities can be ascribed as a source of competitive advantage (Chetty and Stangl, 2010). Furthermore, the reduction of boundaries facilitated by the spread of digital technologies has allowed SMEs to better adapt to fast-changing environments (Acosta et al., 2018; Battistella et al., 2017; Gulati et al., 2000).

4.2. SMEs digitalisation and the impact on value chain activities

Academic literature has exposed how the integration of Industry 4.0 represents one of the main challenges for SMEs, as it plays a vital part in industrial value chains that should be

digitised from suppliers to the end customer (Arcidiacono et al., 2019; Estensoro et al., 2021; Gary et al., 2020; Romanello and Veglio, 2022). Industry 4.0 relies on the construction of an open, smart manufacturing platform for industrial-networked information application, and it is necessary to increase real time data monitoring, the tracking and positioning of products or to hold the instructions to control production processes. This means that Industry 4.0 is a web of structures in which value chain activities (e.g., manufacturing and logistics) intensively use the globally available data and information through digital platforms and networks for an extensively automated exchange of information (Vaidya et al., 2018). This process entails a digitalisation and intelligentisation of manufacturing (Denicolai et al., 2021; Truant et al., 2021). That expression has had a lot of resonance among practitioners and theorists in recent years (Büchi et al., 2020; Oliva et al., 2022; Troise et al., 2022).

The technological impact that industry 4.0 has had on SME internationalisation processes can be ascribed to four principal technologies that have disrupted the internationalisation processes of SMEs (Oliva et al., 2022; Robinson et al., 2019; Ruutu et al., 2017; Hasanov et al., 2022): Internet of Things (IoT), Big Data and Analytics, robotics, and additive manufacturing. The advent of these technologies has led to a shift in the business models and value chain activities of SMEs by either a dematerialisation of the activities (e.g., the chat bot used in customer care) or a change in the operation's location (e.g., production in best-cost countries). Thereby, resulting in an increase in cross-border data availability and a change in the configuration of global value chains (Strange and Zucchella, 2017).

However, to better understand the impact of digital technologies, it is necessary to highlight the main characteristics of each type of technology and its impact on value chain activities (Denner et al., 2018). IoT represents the ability to capture and process data that comes from physical products and to communicate this data to third parties or to interconnect other products (Porter and Heppelmann, 2014; Strange and Zucchella, 2017). From an SME perspective, this ability to control data which derives from physical products enables the boosting of cross-border expansion without maintaining a physical presence in the foreign market (Denicolai et al., 2021). As an example, a great impact of this ability lies in the after sales activity which allows the dematerialisation of the activity or a reduction in the *in loco* intermediaries as non-necessary, since data can be managed remotely. In conclusion, the abundance of data deriving from the IoT has led to the rise of another digital technology, Big Data Analytics. Big Data Analytics allow SMEs with limited resources to scan for new

opportunities in overseas markets by leveraging the analysis of a large quantity of data and sustaining a limited expenditure (McAfee et al., 2012).

Recent literature (Ballestar et al., 2020) has highlighted the growing importance of the uses of robotics to explain the aggregate or sectorial productivity of SMEs. The use of advanced, interconnected and versatile robotics represents an opportunity for companies to boost tailored production, increased productivity and a reorganisation of labour (Autor et al., 2015). Furthermore, the use of robotics has had a positive impact on the re-shoring decisions over production facilities, thereby reducing the cost advantages of best-cost countries (Bettiol et al., 2020).

The last digital disruption that has had a strong impact on the internationalisation process of SMEs is additive manufacturing (Hannibal, 2020; Magnani et al., 2021; Marzi et al., 2018). This technology enables SMEs to separate the different phases of production: design and manufacturing (Bergamaschi et al., 2021). This means that SMEs can locate the design process in areas in which the skills to master advanced software are present and to locate production facilities in other foreign countries, leveraging a global value chain approach (Strange and Zucchella, 2017). Hence, the activities of the value chain can be dispersed geographically, simplified and the relationships between participants made independent (Boikova et al., 2021). The degree with whom SMEs internationalise their global value chain activities is strongly related to specific domains, such as linguistic and cultural similarities (Brouthers et al., 2016; Hennart, 2014; Reuber, 2016; Reuber and Fischer, 2011), adaptation vs standardisation of products and services (L. Li et al., 2012), digitalised business models (Hänninen et al., 2018), speed of internationalisation (Hennart, 2014), development of online networks (Brouthers et al., 2016), foreign market knowledge (Ferraris et al., 2021; Singh et al., 2005) or online–offline presence (Wentrup, 2016).

SMEs that have an international outreach create value by leveraging the use of digital platforms, and their business models are shaped by the way in which they organise their value chain activities and leverage digital technologies (J. Bell and Loane, 2010; Hänninen et al., 2018; Nambisan, 2017). The disappearance of boundaries and the dramatic cost reduction in selling activities have brought the disruption of old business models giving birth to global value chains (Strange and Zucchella, 2017; Tiessen et al., 2001) that enable SMEs to build a competitive advantage based on a leaner value chain (more digitalised and less labour intensive) and stronger digital innovation (J. Bell and Loane, 2010; Foscht et al.,

2006; Gabrielsson and Gabrielsson, 2011; Mathews et al., 2016; Watson et al., 2018).

In conclusion, while the development of the World Wide Web has been the propeller of the digital transformation for SMEs (Vadana et al., 2019), the real driver in the use of digital technologies has been the amount of data that can be processed by SMEs at lower costs (Brouthers et al., 2016; Denicolai et al., 2021; Nambisan, 2017). In fact, with the rise of digital entrepreneurship, the integration of digital technologies into SME value chains and the elaboration of a large amount of data, firms are likely to catch new opportunities in an innovative manner to reach potential customers and be instantaneously operational on an international scale. In general, digitalisation impacts internationalisation processes of firms in terms of accessibility to resources, skills and competences as well as in terms of the potential for learning and knowledge acquisition in foreign markets (Coviello et al., 2017; Hervé et al., 2020). The digitalisation of entrepreneurial processes has enabled SMEs that often have limited resources to develop new configurations of value chain activities and thus evolve their business models or reach new markets (J. Bell and Loane, 2010; Brouthers et al., 2016; Nambisan, 2017; Wentrup, 2016).

The coordination of global value chain activities using ICT infrastructure and new digital technologies (Oliveira et al., 2021; Brennen and Kreiss, 2014; J. Li et al., 2009) has led SMEs to become cross-border by embracing a digital servitisation of some value chain activities (Zahoor et al., 2023b; Brouthers et al., 2016; Vandermerwe and Rada, 1988). This digital servitisation happens because companies need to support their offerings to customers with digital platforms (Vadana et al., 2019) while delocalising production facilities (Afrifa et al., 2022) to ecosystems that have greater technological advancement (Ferreira et al., 2023). It should also be noted that the increased availability of robotics to reduce the cost of manufacturing activities might represent a feeble reshoring of production activities in economically advanced countries (Oldenski, 2015).

4.3. Digitalisation as a mean of foreign markets' knowledge acquisition

IB theorists (M. Fletcher et al., 2013; Musteen et al., 2014; Zahoor and Al-Tabbaa, 2021) have highlighted that the internationalisation process of SMEs is influenced by the degree of knowledge held on a foreign market. A study by Coviello et al. (2017) recognised that digital technologies have paved the way to a wide database for knowledge acquisition in foreign markets by improving communication and information exchange which lowers

location dependencies (Jafari-Sadeghi et al., 2019). Digital technologies enable SMEs to acquire three specific types of knowledge for their internationalisation processes (M. Fletcher et al., 2013; Schweizer, 2012; Zahoor et al., 2023a). The first is technical knowledge, which is essential for SMEs that operate in knowledge-intensive industries to adapt product characteristics to new markets (Autio and Sapienza, 2000). The second type is market knowledge, which is developed by a company in specific markets and is related to three dimensions: institutional knowledge, that is the comprehension of institutional frameworks, governing laws and local norms in foreign markets (Aghazadeh and Zandi, 2021); knowledge of local conditions and opportunities (Chetty and Stangl, 2010; Ricci et al., 2021; Tolstoy et al., 2020); and business knowledge, that is the comprehension of the forces driving the market, for example, the level of competition or the behaviour of customers and suppliers (Blomstermo et al., 2004; Johanson and Vahlne, 2017).

The third type of knowledge is internationalisation knowledge which results from the internationalisation processes of companies and embodies the knowledge acquired in developing and executing internationalisation strategies in different countries (Hervé et al., 2020; Jin and Hurd, 2018). As defined by M. Fletcher et al. (2013), internationalisation knowledge is the ability to search for information, to identify and evaluate opportunities, screen country markets, evaluate strategic partners and manage customs operations and foreign exchange. Internationalisation knowledge also appears not to be country specific as it embodies principles and heuristics to operate in international markets (Donbesuur et al., 2020; L. Li et al., 2004; Prashantham and Young, 2011). However, it is firm specific and it has to be integrated within the company and the organisation.

From a knowledge acquisition perspective, academics have developed a knowledge-based model of the internationalisation processes of SMEs (Mejri and Umemoto, 2010). This knowledge acquisition is enabled by access to and the availability of data on foreign markets. The power of digital technologies resides in their ability to act as mediators of market intelligence (Coviello et al., 2017; Donbesuur et al., 2020; Falahat et al., 2020). It is the ability of digital technologies to convey a large amount of structured or unstructured data to SMEs (Bertello et al., 2020), and hence knowledge, that enables SMEs to exploit this knowledge to accelerate their internationalisation processes.

The lower cost of data procurement through digital platforms, with respect to the gathering of data derived from physical presence in foreign markets, enables SMEs to quickly collect

useful information to shape their internationalisation strategy or to discover new business opportunities (Pergelova et al., 2019). Data collection mainly happens through digital platforms, for example Amazon, Alibaba and Instagram, that facilitate the exchange of information between SMEs and foreign markets (Y.-Y. Lee et al., 2019). Moreover, digital technologies have shortened the distance between companies and foreign competitive arenas, thus allowing SMEs to efficiently maintain relationships with key stakeholders. For example, through digital communication tools that allow SMEs to timely contact suppliers or customers across markets, or even developing knowledge networks resulting in a positive effect on SMEs performance (Felzensztein et al., 2015).

Some empirical studies have shown how the adoption of one or more digital technologies leads to better international performance (Eggers et al., 2017; Gabrielsson and Gabrielsson, 2011; Zhang and Tansuhaj, 2007). Digital technologies have also had a strong impact on the knowledge acquisition in foreign markets that is necessary to develop the marketing capabilities of the firm (Y.-Y. Lee et al., 2019). Digitalised companies can leverage data analytics tools to better target their branding or pricing strategies using predictive models fuelled with data from the foreign target markets, such as data on competitors' sales or even the price sensitivity of the target customers (Autio and Sapienza, 2000; Dhanaraj and Beamish, 2003; Oviatt et al., 1994; Oviatt and McDougall, 2005; Zahra et al., 2000). This means that digital technologies must be considered as a way in which companies access external knowledge and build their internationalisation strategies (Bogers and West, 2012). Thereby enabling the creation and the transfer of knowledge (Urbinati et al., 2019), giving rise to open and distributed innovation processes (Martínez-Román et al., 2019; Remneland-Wikhamn et al., 2011) and consequently, becoming more and more integrated, interconnected and interdependent (Glavas et al., 2019).

The analysis of the literature suggests that the speed of internationalisation of SMEs is directly related to the degree of country-specific knowledge acquired by the firm using digital technologies (Mejri and Umemoto, 2010). This deterministic view might imply that firms expand internationally one country at a time, to a rhythm that is given by the rapidity with which they acquire the country-specific knowledge. However, the literature demonstrates that the traditional view fails to consider that many companies are accelerating their internationalisation processes by simultaneously entering into many international markets (Glavas et al., 2019; Pellegrino and McNaughton, 2017). In fact, this international

expansion is facilitated by the knowledge acquisition processes fostered by digital platforms. These platforms allow SMEs to enhance the learning processes on international markets through immediate access to relevant information (Baum et al., 2023; Jin and Hurd, 2018; Mathews and Healy, 2008).

Academics in the domain of open innovation highlight that knowledge is created through a process based on purposively managed knowledge flows across organisational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organisation's business model (Chesbrough and Bogers, 2014; Kraus, Kailer et al., 2020). Digitalisation is a means to overcome this liability of smallness and enable SMEs to implement open innovation strategies (Zahoor, et al. 2021a). As stated by academics (Eggers, 2020; Freeman et al., 1983), the liability of smallness often coincides with a liability of newness. In conclusion, digital technologies are creating new opportunities for cross-market knowledge acquisition, sharing and learning (Baum et al., 2023; Wang and Hitch, 2017). Consequently, knowledge, skills and capabilities are being rapidly absorbed by SMEs through interactions within digital platforms. This means that within SMEs, the efficient management of knowledge can enhance opportunity recognition in specific foreign markets (Lin and Lin, 2016; Parida and Örtqvist, 2015; Zacca et al., 2015). Furthermore, the analysis of the literature reveals that the development of network capabilities allows SMEs to build interdependencies inside and outside the organisation and enables firms to collect knowledge from specific competitive landscapes (Battistella et al., 2017).

5. Conclusions and implications

In conclusion, this paper has explored the pivotal role of digitalization as a means of internationalization for Small and Medium-sized Enterprises. The literature and evidence presented underscore the transformative power of digital technologies in reshaping the international outreach for these businesses. Digitalization has emerged as a game-changer, dismantling traditional barriers to international expansion. It has empowered SMEs to access global markets, connect with customers worldwide, and efficiently manage international operations. Through e-commerce platforms, online marketplaces, and data-driven marketing, SMEs can now engage with international audiences and tailor their offerings to meet diverse demands. It appears evident that digital transformation is closely linked to a

company's strategic decisions, as highlighted in various studies (Assar and Hafsi, 2019; Bouncken et al., 2019; Kraus et al., 2019a; Matt et al., 2015; Niemand et al., 2020; Ziyadin et al., 2019). Existing research underscores the interconnection between digitalization and internationalization in SMEs, emphasizing the importance of processes for knowledge acquisition, the configuration of value chain activities, the scalability of business models, and the utilization of ICT infrastructures and digital platforms (Caputo et al., 2022; Scuotto et al., 2020; Cassetta et al., 2020; Stallkamp and Schotter, 2021). Given this theoretical foundation, our proposal for a systematic literature review aims to provide a comprehensive overview of existing findings and to highlight potential avenues for further research in the integration of digitalization and internationalization within SMEs.

Nevertheless, it is crucial to acknowledge that the journey towards internationalization through digitalization is not without challenges. SMEs must address issues of data security, compliance with international regulations, and the need for continuous adaptation to evolving digital trends. TO cope with this fast changing environment a crucial role is played by knowledge. In fact, the effective implementation of knowledge management systems plays a pivotal role when conducting business abroad. In summary, the literature highlights how digitalization has transformed the landscape for SME internationalization. It has provided unprecedented opportunities for SMEs to expand globally, connect with customers, enhance operations, and compete effectively. However, SMEs must navigate challenges related to data security, compliance, and the need for ongoing adaptation to harness the full potential of digitalization in their internationalization efforts.

Building on the knowledge-based view (KBV), we put forward that SMEs that embrace digitalization stand to gain a competitive edge in international markets. Moreover, the findings of this study contribute to the strengthening of the research that posits that the existing knowledge within a firm, coupled with its continuous process of acquiring, sharing, and transferring new knowledge, serves as a catalyst for more effectively harnessing innovation capabilities and attaining superior performance (Holsapple and Wu, 2011). This perspective has introduced the role of knowledge acquisition relative to a foreign market as a propeller for internationalisation. Academics have underpinned how the digitalisation of SMEs has taken a central role in their internationalisation processes as it represents a medium by which to acquire knowledge about foreign markets (Bai et al., 2021; M. Fletcher et al., 2013; Johanson and Vahlne, 2017; Zahoor and Al-Tabbaa, 2021).

As we look ahead, the convergence of digitalization and internationalization promises new opportunities and complexities for SMEs. Therefore, a commitment to ongoing learning, innovation, and the strategic utilization of digital tools will be instrumental for SMEs seeking to thrive in an increasingly interconnected global marketplace. In sum, digitalization is not merely a tool for internationalization; it has become an imperative pathway for the growth and sustainability of SMEs on the international stage.

5.1. Theoretical implications

The current study puts forward the following theoretical implications. First, the paper contributes to the literature on digitalisation of SMEs (Coviello et al., 2017; Gruber, 2019; Strange and Zucchella, 2017) by proposing new domains of analysis on the digitalisation process. This research proposes that in antithesis to classical studies in the field (Roque et al., 2019), international expansion is propelled by the use of digital technologies and the knowledge acquisition process that happens through digital platforms. Furthermore, these digital platforms allow SMEs to enhance the learning processes about international markets through immediate access to relevant information. Second, this study adds to the body of literature on IB (M. Fletcher and Harris, 2012; Morgan-Thomas and Jones, 2009; Sinkovics et al., 2013) by proposing that the rise of digital entrepreneurship has enabled SMEs to evolve their business models and reach new markets overcoming the liability of smallness through the development of new value chain configurations (J. Bell and Loane, 2010; Brouthers et al., 2016; Wentrup, 2016). Third, the paper constitutes a guideline for conducting future research (Figure 3) on the intersection between these two phenomena. In fact, we propose 15 promising research avenues, for scholars wanting to delve deeper into the streams of research that have emerged from this study.

Digitalisation is viewed as an opportunity for SMEs to enter the international market as it represents a favourable business environment within which to assess resources and to leverage firm capabilities for early and rapid internationalisation (Hervé et al., 2020; Pagani and Pardo, 2017). As opposed to large multinationals, SMEs often have limited resources for trial and error in entering foreign markets. Digital transformation requires a substantial investment due to the adoption cost of digital technologies (Choshin and Ghaffari, 2017; Falahat et al., 2020). Understanding the impact of digitalisation on the decision-making

process for internationalisation is key to being able to expand for growth and survival (Aghazadeh and Zandi, 2021; Denicolai et al., 2021).

As expressed by academics (Eggers, 2020; Freeman et al., 1983; Schweizer, 2012), SMEs also face the liability of smallness. This type of liability implies that the smaller the firm, the less resources it typically controls, making it more vulnerable to internal and external events, such as a change in the organisation, a decline in financing options, a new competitor entering the market or a global crisis. This liability of smallness is often amplified by the liability of newness (Freeman et al., 1983). The liability of newness entails that new organisations suffer a greater risk of failure than older organisations due to the lack of an established business model and low levels of legitimacy. Digital technologies do not give rise to productivity improvements until SMEs and their employees have achieved the required technological and educational training and value chain activities are reconfigured to adapt to new organisational and cultural skills. In other words, digitalisation in SMEs requires organisational and business process changes to fully exploit new international growth opportunities.

Overall, our study supplements the jeopardised literature regarding the effect of digital technologies on SME internationalisation (Kergroach, 2020), by differentiating between the effects of digital platforms and ICT infrastructure on SME internationalisation (Bertello et al., 2020; Cenamor et al., 2019; Denicolai et al., 2021), the impact of SME digitalisation on value chain activities (Magnani et al., 2021; Westerlund, 2020) and the role of digitalisation as a medium to gain foreign market knowledge (Blomstermo et al., 2004; Ferraris et al., 2021; Fletcher and Harris, 2012). Furthermore, this study identifies the bounding forces of digital transformation and internationalisation in SMEs and offers some novel aspects related to how digitalisation shapes SME internationalisation. With the emergence of the platformisation of business models (Gierlich et al., 2019), our study also offers the opportunity for further research on this underdeveloped area in the field of small business research.

5.2. Managerial implications

This research has major implications for practitioners. It shall help managers in clarifying how to build a digitalization strategy that aligns with the company's internationalization goals. It shall help practitioners and entrepreneurs that want to understand how and under

what conditions SMEs can leverage digital technologies in the internationalisation process and what are the bounding conditions that might prevent the implementation of ICT infrastructures in SMEs. Managers should not overemphasise or overly rely on digital technologies but should realise the value of developing improved digital capabilities within the organisation. More specifically, this research shall be helpful to identify key digital tools and platforms that can help SMEs to reach new markets, expand their customer base, and improve their operational efficiency.

Moreover, we highlight the necessity for managers to invest in the necessary digital infrastructure, such as e-commerce platforms, customer relationship management (CRM) systems, and supply chain management software. These infrastructures will enable SMEs to operate more effectively in the digital environment and meet the needs of international customers. Furthermore, we point out the necessity to hire and train digital talents. Managers should hire and train employees with the necessary digital skills and expertise to implement the company's digitalization strategy and knowledge. This could include digital marketers, data analysts, and IT professionals who can help the company leverage digital tools, growth hacking strategies and platforms to achieve their internationalization goals.

Finally, we suggest managers to embrace data-driven decision making by using data analytics to inform their internationalization strategies and make informed data-driven decisions. This could involve collecting and analyzing customer data, market trends, and competitor insights to identify new market opportunities and optimize the company's product offerings. We suggest to managers, entrepreneurs and practitioners that the digital capabilities of SMEs offer benefits to exports when they are embedded in specific higher order innovation and knowledge capabilities. From a collaborative perspective, managers shall build partnerships and collaborations with other companies, organizations, and governments to leverage digital technologies and expand their international reach.

6. Future research avenues

The future research directions are proposed based on the conceptual framework developed for the systematic literature review which identified the research gaps in each article and analysed the contents of the articles to find the correlations among them (see Figure 3).

[Insert Figure 3 near here]

6.1. Internationalisation of SMEs through digital technologies: The role of ICT and digital platforms

Digital transformation has enabled SMEs to sustain lower costs of internationalisation by avoiding a fully 'physical' process of expansion. Capital expenditures are no longer necessary to open operational branches abroad or new points of sale in the targeted countries. However, the impact of digital technologies at the different stages of the internationalisation processes of SMEs remains a topic that needs further analysis. Future research could provide timely insights on which specific technologies could help in different internationalisation stages.

Moreover, as expressed by academics, e-commerce and digital platforms represent a key resource for SMEs to overcome the liabilities of smallness and newness. Future research could focus on which digital platforms or e-commerce platforms foster internationalisation for SMEs and the characteristics which are proper to those platforms that enable them to endure lower costs compared to multinational companies (MNEs). It would also be of interest to understand which capabilities and processes SMEs need to implement in order to perform on those digital platforms.

The role of the owners in the adoption of new technologies has been underlined as a potential drawback in the internationalisation processes of SMEs. Future research could examine family owned companies and whether the role of the family as a strategic decision maker could represent a barrier to digitalisation for the internationalisation processes.

Finally, from the perspective of a resource-based view, it is necessary to shed light on the intangible resources needed to implement digital technologies that can foster SME internationalisation strategies. It is well known that SMEs suffer the liability of smallness and are more exposed to shifts in the organisational model of the company. Future research could address the topic by deepening an understanding of which resources in terms of human capital and ICT-schooled capital are essential to foster foreign expansion as well as to deepen an understanding of which specific skills, competences and capabilities are the antecedents to internationalisation.

6.2. SME digitalisation and the impact on value chain activities

By integrating digital technologies into value chain activities, SMEs are able to elaborate a large amount of data to catch new opportunities in an innovative manner. In general, digitalisation impacts the internationalisation processes of firms in terms of the accessibility of resources, skills and competences in foreign markets.

The extant literature has demonstrated that the value creation surplus that derives from the digitalisation of value chain activities has an impact on SME business models. Future research could deepen knowledge about how SMEs reorganise value chain activities to capture value along the chain and how SMEs reorganise their business models to maximise value capturing.

Digitalisation as a means to facilitate internationalisation exposes SMEs to digital-related risks. International SMEs are more likely to suffer from downtime due to data security breaches and thus put more effort into patching their systems and applications. Future research could deepen an understanding of how SMEs mitigate those risks and which activities of the value chain are more vulnerable to those risks.

Emerging economies are another interesting context of analysis for future research. The increased interconnection between companies and activities in the value chain could lead scholars to focus their attention on emerging countries where a multitude of niche markets are rapidly flourishing due to digitalisation. Future research could focus on finding new theoretical models to better adjust the existing frameworks on internationalisation and digitalisation of SMEs.

6.3. Digitalisation as a mean of foreign market knowledge acquisition

As compared to large or multinational companies, SMEs have relatively fewer resources, which makes knowledge acquisition vital for their survival and prosperity. The lack of tangible resources has to be compensated by intangible resources, that is, knowledge, or SMEs will not be able to compete.

Future research avenues could focus on the analysis of the role of digital technologies in knowledge acquisition in the context of developing countries or on the impact of knowledge in the internationalisation strategies towards developing countries/markets. Finally,

knowledge sources appear to be a key success factor in internationalisation. However, in emerging markets, the quality of data and information is lower than in developed countries. The challenge in knowledge acquisition is to choose and capture big data from diverse sources. Future research avenues could identify the relevance of the sources of data for internationalisation by developing frameworks or models that overcome the problems of data overload and data quality in order to understand the impact on value chain and marketing activities.

Future research could tackle the aspect of innovation with a particular focus on open innovation processes to investigate how open innovation helps in integrating digital technologies for SME internationalisation. It could also focus on the degree of tacitness of the proposed different knowledge dimensions (e.g., technical knowledge, market knowledge and internationalisation knowledge). It would be of interest to understand how digital technologies can help SMEs face that challenge or how open innovation could help SMEs to gather market specific knowledge in their internationalisation processes.

The intersection between digitalisation and open innovation strategies could be a fresh key to provide SMEs with new models of international development. It would be interesting to deepen the role of digitalisation in SMEs as a means to generate social ties to reduce the liabilities of newness and foreignness. More specifically, to understand if digitalisation helps SMEs to not only access adequate relationships but also to develop resources and capabilities necessary to alter existing relationships.

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