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Digitalization and Internationalization

Welcome to the April issue of the Technology Innovation Management Review. We invite your comments on the articles in this issue as well as suggestions for future article topics and issue themes.

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Our readers are looking for practical ideas they can apply within their own organizations. The TIM Review brings together diverse viewpoints —from academics, entrepreneurs, companies of all sizes, the public sector, the community sector, and others —to bridge the gap between theory and practice. In particular, we focus on the topics of technology and global entrepreneurship in small and large companies.

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Editorial: Digitalization and Internationalization

Christophe Schmitt and Rico Baldegger

Welcome to the April issue of the Technology Innovation Management Review.

Digitalization and Internationalization

The University of Lorraine, France and the School of Management Fribourg (HEG-FR) of the University of Applied Sciences and Arts Western Switzerland (HES-SO) have collaborated on research projects and teaching activities for several years now. The goal of this partnership is to shed light on the challenges for micro, small and medium-size enterprises (MSMEs) in the interrelation between digitalization, internationalization, and entrepreneurship.

In recent years, the internationalization of MSMEs, especially in countries with a small domestic market, has become increasingly more focused on the dimensions of economic policy and has found its way into media coverage. Expansion abroad is also more widely regarded by MSMEs as a fundamental strategic option to gain competitive advantage. However, due to the heterogeneity of the MSME landscape and companies' internationalization behavior, it is difficult to identify the success factors or to measure success. To enable MSME decision-makers to influence their internationalization behavior more specifically and, at the same time, to receive more effective and efficient support from representatives of both public and private internationalization helpers, it is first necessary to take a differentiated look at current circumstances.

On the one hand, it is first necessary to define which different types of internationally active MSMEs actually exist: there are young, globally active MSMEs, for example, which offer highly qualified workers interesting jobs as important innovation carriers and developers. Then there are medium-sized companies, which are present in international markets and function successfully as established suppliers in more traditional sectors. All MSMEs deserve attention, as it is they who, thanks to ongoing innovation, are successfully expanding their global and international orientation and opening up new markets. Like large global businesses, all these small and medium-sized companies also belong to a spectrum of internationally active companies.

On the other hand, the attitudes and views of entrepreneurs regarding internationalization also

deserve attention; both can provide insightful indications as to which framework conditions must be created in the future in order to increase success in foreign markets. The question of a successful business model in times of turbulent change and digitalization must be answered with proactive entrepreneurial behavior.

Hence, digitalization is playing an increasingly important role in business and society, and all institutions are facing a fundamental need for radical changes in their strategy, structure, and corporate culture. To succeed in foreign markets, the use of digital infrastructures presents new opportunities for international MSMEs. These companies need to define a new international value proposition, based on an integrated digital strategy with all ecosystem stakeholders in various parts of the world. At the same time, digitalization is an opportunity for MSMEs to “go international” through lower risk export modes, such as direct exports and special offerings, in combination with utilizing machine learning or digital leverage effects in their global value chain. To achieve this, they maximize their entry mode attractiveness by targeting niche markets, along with innovative, high-quality products and services. Digitalization has reduced distances between countries and global cities, shaping international user communities, democratizing around the world consumption, and improving communication. Digital platforms, for example, provide essential databases for companies that bring real opportunities through innovative ways to reach potential customers. Digitalization presents new opportunities in terms of skill sharing, open innovation, and partnership formation between companies. Thus, internationalization and digitalization have become collective activities.

As internationalization and digitalization are becoming increasingly intertwined, the question arises whether digitalization is shifting the borders in such a way that new, borderless, internationalization concepts have to be developed. Similar issues involve whether the focus should be on cities rather than countries, and if or how the speed of learning should be put in the foreground. In this way, digitalization provides companies with new fundamental experiential knowledge, enabling them to conduct faster market experiments in more countries than before.

Editorial: Digitalization and Internationalization

Christophe Schmitt and Rico Baldegger

This special issue of the TIM Review presents several articles on the fertile interrelation between and multiple challenges of internationalization and digitalization of MSMEs. In light of how the use of digital technologies is creating more fluidity and nonlinearity across time and space in entrepreneurial processes, **Hervé, Schmitt and Baldegger** adopt a conceptual process to investigate how the digital transformation of MSMEs will support decision-makers in international businesses. The article illustrates, based on a quantitative research design, that the greater the extent to which international MSMEs have digitalized their functions, the more they favor entrepreneurial behavior to lead successful strategic decisions in foreign markets. The authors propose several ways to benefit from the opportunities provided by using digital technologies.

Dethine et al. examine the impact of SMEs' digital transformation on their internationalization capability. Relying on an extensive exploratory literature review and SME export practices, the authors highlight that export practices are related to the strategic vision of a firm, the customization of its offer, its network dynamic, and its internal organization.

An empirical analysis featuring the importance of global business hubs for internationalizing SMEs is conducted by **Wild**. This article investigates the influence of psychic and geographic distance, as well as country- and market-related variables, on the preference of high-technology SMEs to connect with, and settle into, major business hubs. The empirical findings suggest that the more internationalizing high technology SMEs tend to connect with, or settle into, foreign market business hubs, the further these focal markets are from their home market.

Westerlund shows in his paper how internationally oriented online SMEs differ in terms of their digitalization from those focused on domestic markets, and how these differences are related to their business model scaling. The study applies a quantitative descriptive analysis of survey data on business adoption of digital technologies by online-based SMEs in Canada. He suggests that online SMEs willing to scale through digital internationalization need to not only develop a set of capabilities in regard to partnering, customer relationships, and business process management, but also must invest in ICT resources and cyber resilience.

Hererra et al. analyze the promotions that institutions give to small and medium international enterprises on

the subject of digital marketing. Qualitative research with a descriptive scope was developed for this purpose. The authors draw conclusions regarding the promotion of digital marketing in SMEs by institutions and how these promotions carried out vary between countries. The authors illustrate with examples from Costa Rica and France, with Costa Rica providing more general and structured services, while France offers more customized ones.

Baldegger, Caon, and Sadiku, explain the impact of artificial intelligence (AI) on human resource management (HRM) and the moderating effect of entrepreneurial orientation (EO). A quantitative study assesses the perceived value of AI in HRM, including risks and constraints, as well as plans for introducing AI. The results indicate a positive perception of AI adoption in HRM, little fear of job losses, and a generally positive impact expectation for adopting AI in HRM. They also show that the introduction of AI is profoundly dependent on the EO of a company.

This special edition should help to render adequate support for MSMEs and inspire future research to collect quantitative and qualitative data that empirically studies the iterative relation of digitalization and internationalization. Such data would be valuable for better understanding how digitalization will influence internationalization models and strategies, and vice versa.

Guest Editors
Christophe Schmitt and Rico Baldegger

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Digitalization, Entrepreneurial Orientation and Internationalization of Micro-, Small- and Medium-Sized Enterprises

Annaële Hervé, Christophe Schmitt, Rico Baldegger

“ In the new world, it is not the big fish which eats the small fish, it's the fast fish which eats the slow fish. ”

Klaus Schwab,
Founder and Executive Chairman,
World Economic Forum

Nowadays, we are living in a digitally connected global economy that is completely transforming trade in foreign markets and exposing firms, particularly micro, small and medium-sized enterprises (MSMEs), to major changes and new opportunities. As the use of digital technologies is creating more fluidity and nonlinearity across time and space in entrepreneurial processes, our research adopted a conceptual process to investigate how the digital transformation of MSMEs will support decision-makers in international businesses. Based on a quantitative research design, we demonstrate that the more a company digitalizes its functions, the more it favours entrepreneurial behavior to lead successful strategic decisions in foreign markets. Our results are discussed in detail and we propose several ways to benefit from opportunities arising from the use of digital technologies.

Introduction

With the advent of digital technologies, a new industrial revolution has arrived, bringing disruptive changes along with future progress (Schwab, 2017). At the heart of this, businesses and society are transforming in such a way that institutions are faced with a fundamental need for radical changes in their structure and operating methods. They are developing complex economic systems that must grasp, in a concrete manner, many elements involving dynamic interactions (Morua et al., 2015). Nowadays, the digital context is transforming the very paradigm of international business. This requires companies to find new opportunities to maintain their competitive advantage not only domestically, but also abroad. The changes are major and, given the fact we are living in an increasingly hyperconnected world, micro, small and medium-sized enterprises (MSMEs) are particularly exposed to new challenges and opportunities in foreign markets (Manyika et al., 2016).

For decades, trade in goods and services between nations has defined the image of globalization.

However, although the dynamics of physical flows are currently moderate, globalization is not slowing down. On the contrary, many flows of data continuously move across borders and their volume has increased considerably. As a result, globalization is dematerializing and redefining itself with the faster pace of these information and data exchanges. In this context, digital technologies and platforms have been created to reach new markets, serving to resize the economics of cross-border business, notably by reducing costs, shortening transactions and increasing market knowledge through greater interactions. In other words, as outlined by Manyika and colleagues (2016), *digital globalization is changing who is participating, how business is done across borders, how rapidly competition moves, and where the economic benefits are flowing.*

To date, research has clearly demonstrated that in order to make a difference in foreign markets, companies need to adopt an entrepreneurial orientation (EO) by being innovative, proactive, and risk-taking in their decisions. Because emerging technologies are creating more fluidity and nonlinearity in entrepreneurial processes

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and activities across time and space (Nambisan, 2017), we are convinced their use supports firms in adopting new behaviors for differentiating themselves from competitors, anticipating future changes, and undertaking investments with uncertain results. Indeed, the use of digital technologies —and, in particular, their convergence — offers a range of possibilities to optimize operations and redesign value creation. Over the last decade, research has been conducted to address either particular aspects of digitalization and internationalization of firms (Ziyae et al., 2014; Autio & Zander, 2016; Coviello et al., 2017; Hagsten & Kotnik, 2017; Strange & Zucchella, 2017; Brouthers et al., 2018; Hannibal & Knight, 2018; Neubert, 2018; Ojala et al., 2018; Stallkamp & Schotter, 2018; Watson et al., 2018; Wittkop et al., 2018; Enjolras et al., 2019) or EO and internationalization of firms (Knight, 2001; Jantunen et al., 2005; Covin & Miller, 2014; Brouthers et al., 2015; Reuber et al., 2018). However, few studies have relied on empirical evidence to test the effects of digitalization on internationalizing firms, and none of them have integrated the concept of EO.

In light of these observations, our research aims to propose a new look at traditional theories by introducing a conceptual process regarding the relationship between digitalization, EO, and the internationalization of MSMEs. On the basis of a quantitative survey, this study aims to (1) investigate the relationship between the degree of digitalization and the degree MSMEs' EO, and (2) investigate the relationship between each EO component and the internationalization intensity of MSMEs. The focus of the study is on gaining an understanding of how the use of digital technologies can support entrepreneurs' behaviors, that in turn, will support decision-making to enhance the propensity to internationalize. By exploring a significant phenomenon for the future of MSMEs (Manyika et al., 2016), the study aims to provide a new dynamic for contemporary research on globalization and to illustrate the reality on the ground (Delios, 2017).

Literature Review and Hypotheses

International Entrepreneurship

Over time, researchers have incorporated multiple theoretical perspectives to explain the internationalization of firms. Although research initially focused mainly on large firms, many authors have explored the pattern and pace of

internationalization of new ventures since the 1990s (Coviello & McAuley, 1999; Gankema et al., 2000; Lu & Beamish, 2001; Zahra & George, 2002; Rialp et al., 2005; Ruzzier et al., 2006; McAuley, 2010). The implications of this research resonate with the increasing amount of evidence compiled regarding entrepreneurial firms aiming at rapid internationalization, which are small, resource-poor, and in some cases at an early stage in their development. So far, conventional theories from international business have argued that smaller and younger firms were limited in resources and inexperienced in dealing with global trade (Brouthers et al., 2015). Traditional frameworks were based mainly on linear and sequential processes of internationalization, assuming that knowledge should be acquired gradually over time (Johanson & Vahlne, 1977). The emphasis on these smaller firms gaining a competitive advantage in multiple countries from inception has brought the emergence of a new research stream (Knight & Liesch, 2016); International Entrepreneurship (IE), where international business and entrepreneurship theories intersect. The interest here is in drawing a theoretical base and perspectives on MSMEs and young firms that venture abroad (Oviatt & McDougall, 1994; McDougall & Oviatt, 2000; Zahra & George, 2002; Oviatt & McDougall, 2005; Rialp et al., 2005; Baldegger & Schueffel, 2009; Keupp & Gassmann, 2009; Jones et al., 2011; Autio, 2017).

IE and Entrepreneurial Orientation

At the outset, IE was first defined as *a combination of innovative, proactive, and risk seeking behavior that crosses national borders and is intended to create value in organizations* (McDougall & Oviatt, 2000). This definition of IE is closely linked with the concept of EO, which is *the propensity to use new behaviors for anticipating and acting on future changes in the external environment, and the willingness to undertake investments with uncertain results* (Lumpkin & Dess, 1996). Researchers have suggested that EO provides one of the key capabilities for building competitive advantage in markets (Lumpkin & Dess, 1996). In IE, the popular emergence of the role of entrepreneurial behavior has been broadly investigated and gave birth to International Entrepreneurial Orientation (IEO), which is a multi-dimensional concept that captures the propensity of entrepreneurs to be innovative and proactive, and to take risks in an international context (Knight, 2001; Covin & Miller, 2014). According to this concept, EO seems to provide the company with skills to make better use of its internal resources, to obtain and exploit resources from external sources more efficiently,

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and thus, to enhance its internationalization prospects (Jantunen et al., 2005; Brouthers et al., 2015).

Notwithstanding the EO perspective (see this edition Baldegger, Caon, Sadiku 2020), Oviatt and McDougall (2005) argued that the combination of innovative, proactive and risk taking behaviors was not the only entrepreneurial dimension related to IE. Thus, they proposed an alternative view, one that was more focused on recognising opportunities, thus defining IE as: *“the discovery, enactment, evaluation, and exploitation of opportunities – across national borders – to create future goods and services”* (Oviatt & McDougall, 2005). The inclusion of opportunity as a driver of internationalization has been recognized by prominent IE scholars but, as pointed out by Reuber and colleagues (2018), the meanings and roles of those opportunities remain underdeveloped.

Nowadays, with the burgeoning digital economy and global business ecosystems, factors enabling the discovery and pursuit of new opportunities have become more persuasive (Autio et al., 2018). These nascent factors are influencing the processes and strategies of internationalizing MSMEs by allowing them to rethink their business models thanks to the use of digital technologies (Andersson et al., 2014). In this context, several opportunities are emerging for defining new strategic orientations and new forms of internationalization (Coviello et al., 2017; Kriz & Welch, 2018) and, as mentioned by Knight and Liesch (2016), it is currently fundamental to study the role of digitalization in recognizing and exploiting those future opportunities for international trade. Thus, a wide body of literature has recently emerged that focuses on jointly addressing IE and digitalization (Kollmann & Christofor, 2014; Ziyae et al., 2014; Autio & Zander, 2016; Coviello et al., 2017; Etemad, 2017; Hagsten & Kotnik, 2017; Strange & Zucchella, 2017; Brouthers et al., 2018; Hannibal & Knight, 2018; Kriz & Welch, 2018; Neubert, 2018; Ojala et al., 2018; Stallkamp & Schotter, 2018; Watson et al., 2018; Wittkop et al., 2018; Chen et al., 2019; Enjolras, Camargo, Schmitt, 2019; Banalieva & Dhanaraj, 2019; Monaghan et al., 2019;). However, studies have mainly tested the internationalization patterns of technological firms and little research relies on empirical data for measuring how digital technologies affect the activities of established internationalizing MSMEs. Furthermore, as an investigation focusing on new digital opportunities with regard to the strategic position is overdue, we aim to address this gap in the

literature by empirically testing how the degree of digitalization affects the orientation of firms, as well as how this orientation affects the intensity of internationalization. We propose a new look at traditional theories on internationalization by conceptually studying the process of relations between digitalization, EO, and internationalization of MSMEs.

Digital Entrepreneurship

Digital entrepreneurship (DE) emerged a decade ago at the intersection of digitalization and entrepreneurship. Principally based on a theoretical foundation of entrepreneurship, which involves recognizing, seizing and transforming opportunities into marketable goods or services to create new value, DE is of growing interest to more and more scholars (Hull et al., 2007; Davidson & Vaast, 2010; Giones & Brem, 2017; Nambisan, 2017; Le Dinh et al., 2018; Hsieh & Wu, 2019; Kraus et al., 2019). The origin of this research stream emerged following the rapid technological advances that have transformed the very nature of entrepreneurial activities and made it possible to overcome the uncertainty inherent in the processes and results of entrepreneurship (Nambisan, 2017). DE can be defined as a subcategory of entrepreneurship, *“the pursuit of opportunities based on the use of digital media and other information and communication technologies”* (Davidson & Vaast, 2010). Because digital technologies create more fluidity and nonlinearity across time and space into entrepreneurial processes, DE aims to define how these nascent technologies and their unique characteristics can be used to shape entrepreneurial activities and orientation (Nambisan, 2017). Research on DE is therefore growing at the heart of the digitalization phenomenon, which is often faced with terminological confusion. By linking research work to information technology and DE, we provided a theoretical approach to these notions.

First, we drew a distinction between the two closely related concepts “digitization” and “digitalization”. According to Tilson and colleagues (2010), the first term digitization is a “technical process” that renders technologies digital. It means converting and representing something analog or physical into a digital format that can be used by a computing system. Thanks to digitization, information can be standardized into the same format and be processed by the same technologies. Digitalization, on the other hand, is *“a sociotechnical process of applying digitizing techniques to broader social and institutional contexts that render digital technologies infrastructural”* (Tilson et al., 2010). In other words, it is the combination and application of digital technologies

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within an organization, economy, and society, in order to create and share value. Nowadays, many societies are experiencing a new wave of digitalization (Legner et al., 2017), characterized by the emergence and converging of many innovative technologies in the domains of robotics, artificial intelligence, the internet of things, mobile applications, augmented and virtual reality, big data, cloud, 3D printers, blockchain, nanotechnology, biotechnology, and quantum computing. The application and overlap of these digital technologies are impacting many segments of companies by drastically transforming and dematerializing temporal and spatial dimensions of businesses, as well as expanding global access.

DE and the role of entrepreneurs

To truly understand digitalization and the resulting creation and enactment of entrepreneurial opportunities, we address DE in a more applied context, thanks to expanding knowledge in the literature. The digital environment provides a competitive landscape in which taking an entrepreneurial strategic posture may be particularly beneficial to MSMEs. Because firms might be expected to preserve a market advantage by demonstrating innovative, proactive, and risk-taking efforts (Covin & Slevin, 1989), the use of digital technologies offers new opportunities to enhance current entrepreneurial orientation by optimizing processes, managerial, and strategic decisions (market entry, customer targeting, partnership, pricing decisions), and customization (Lumpkin & Dess, 2004; Watson et al., 2018; Kraus et al., 2019; Aagaard et al., 2019). Digital technologies create more variability in entrepreneurial activities and allow MSMEs to rapidly and easily enhance their capabilities and performance to create value (Lumpkin & Dess, 2004; Nambisan, 2017).

However, the widespread adoption of digital technologies has also changed the role of founders. Indeed, governance becomes less centralized and thus more distributed between groups of actors that share value creation (Nambisan, 2017). Although research on entrepreneurship has so far focused mainly on the entrepreneur as an individual who leads operations from the idea inception to its realization, the use of digital technologies is extending this role by allowing a broader set of actors, with different goals, to participate in entrepreneurial initiatives. As Nambisan (2017) highlighted, these new stakeholders, either individuals or ventures, are directly involved in opportunity recognition and processes by, for instance, the use of

digital platforms, social media, or even crowdsourcing and crowdfunding systems. This creates a global network with a plethora of new possibilities and opportunities for innovative collaboration, strategic alliances, co-creation, open innovation, networking, and creativity (Bell & Loane, 2010). However, the implementation of digital technologies has triggered a change in firms' functions. Entrepreneurs are then faced with transformation across internal and external dimensions of their business (Bharadwaj et al., 2013; Pagani, 2013; Gray & Rumpe, 2015; Matt et al., 2015; Porter & Heppelmann, 2015; Schallmo et al. 2017; Autio et al., 2018; Aagaard et al., 2019; Kraus et al., 2019). These dimensions can be categorized, as suggested by research carried out by Greif and colleagues (2017), through four main pillars of transformation, including at an internal level, **processes and infrastructure (operations)** as well as **people and culture (training)** and, at an external level, **digital sales (experience)** as well as **customer involvement (relationship)**.

By combining current capabilities with capabilities enabled by digital technologies, firms can shape a new value proposition and orientation supported by decision-makers (Westerman et al., 2011; Bharadwaj et al., 2013; Pagani, 2013; Kane et al., 2015; Matt et al., 2015; Ross et al., 2016; Sebastian et al., 2017). Therefore, as the literature assumes a relationship between digitalization and managerial decisions, we developed our baseline hypothesis to examine the effect of the degree of digitalization on the EO of MSMEs.

Hypothesis 1: *A high degree of digitalization contributes positively to an increase in the degree of EO in MSMEs.*

We were interested in investigating the extent to which the use of digital technologies could be a source of opportunities for internationalizing MSMEs. Thus, as we assumed that the implementation of such techniques supports their EO, we then intended to observe how EO is related to the internationalization intensity of the MSMEs surveyed. To evaluate and identify the internationalization intensity of firms, the literature suggests different measures and determining factors (Oviatt & McDougall, 1994; Jones & Coviello, 2005; Ruzzier et al., 2006). The most frequently used measures underpinning internationalization intensity consist of four main indicators, including the **scale** (share of turnover from foreign markets), the **scope** (geographical market involved), the **speed** (rate at which revenues are generated), and the **mode** (market entry for cross-border activities) (Oviatt & McDougall, 1994; Zahra & George,

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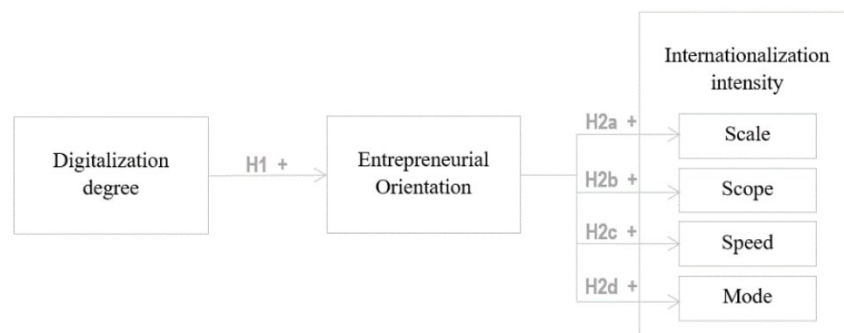


Figure 1. Research framework

2002; Jones & Coviello, 2005; Ruzzier et al., 2006; Kuivalainen et al., 2007; Brouthers & Hennart, 2007; Andersson et al., 2014). As reflected in the relevant literature, an entrepreneur's experience and their global mindset are prerequisites for successful internationalization in terms of increased intensity. Therefore, our next hypothesis indicates that we expected greater EO to be associated with internationalization intensity among MSMEs.

Hypothesis 2: *A high degree of EO contributes positively to an increase in a) the scale, b) the scope, c) the speed, and d) the mode of internationalizing MSMEs.*

The proposed research framework and the formulated hypotheses are highlighted in Figure 1. This representation shows a conceptual process in which the degree of digitalization supports EO, and in turn, affects the internationalization intensity of MSMEs.

Methodology

Sample and data collection

To gather empirical evidence, our study relied on a quantitative research design. Based on the key determinants of DE, EO, and IE compiled from literature, the quantitative approach took stock of the Swiss context. Highly involved on the international stage and given its cultural and language diversity, Switzerland is a good representative of internationalizing firms. Approximately 99% of companies are MSMEs, which account for more than two thirds (67.6%) of total business employment (FSO, 2019). This high proportion demonstrates the major role MSMEs play in the Swiss economy. Approximately 9% of the 586,2147 companies registered in Switzerland export goods every year (FCA, 2019),

representing around 40,000 MSMEs. These firms make a significant contribution to the total export of Swiss goods, with an overall share amounting to 45% (FSO, 2019). Although Switzerland is resource poor, it is nonetheless highly competent in basic and innovative technologies (GDS, 2018), thus comprising an interesting setting with respect to digitalization. We tested our hypotheses using a secondary database from Swiss internationalizing MSMEs (Baldegger et al., 2019). Maintaining the relative weight of each category, 8,000 firms were randomly selected and surveyed; hence including almost 20% of the total exporting Swiss MSMEs. To ensure homogeneity in our sample and because we were interested in MSMEs, we excluded firms with more than 250 employees. Moreover, we only took into consideration firms that generate more than 5% of their annual sales revenue in foreign markets. Our final sample comprised 190 MSMEs that met our inclusion criteria. On average, respondents have been selling and trading in foreign markets for more than 30 years and generate around 55% of their total revenue abroad. The selected MSMEs taken into consideration have on average 60 employees and come mainly from manufacturing and professional services.

Measures

Within our database, we focused on specific measurements that were validated in existing literature, and thus relied on three key variables in the empirical analysis: degree of digitalization, entrepreneurial orientation and internationalization intensity.

Degree of digitalization

The variable degree of digitalization consists of a four-item scale related to various strategic pillars of companies (Greif et al., 2017). Based on a self-evaluation, companies were asked to assess the level of

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digitalization of each item using a score range of 1 to 4. The four items are divided into two internal pillars — **processes and infrastructure**, as well as **people and culture**, and two external pillars — **digital sales** and **customer involvement**. To measure each dimension as comprehensively as possible, respondents were asked to scale their degree of digitalization on the basis of four statements that helped firms to position themselves on a score ranging from 1 to 4. The higher the score of the selected statements, the higher the degree of digitalization.

Entrepreneurial orientation

To measure the EO of our sample, we used the questionnaire developed by Colvin and Slevin (1989). It consists of nine items consolidated under three unidimensional strategic orientations: innovativeness, proactiveness, and risk-taking. Managers for our survey were asked to indicate the extent to which each item reflects their strategic posture on a seven-point Likert scale that divided pairs of opposite statements. The higher its overall score, the more entrepreneurial the company's strategic posture (Covin & Slevin, 1989; Lumpkin & Dess, 1996).

Internationalization intensity

To articulate the intensity of internationalization, we focused on four factors: the scale, scope, speed and mode of internationalization. Firstly, we measured the scale indicator with the percentage of sales derived from foreign market activities to total firm sales revenue (Oviatt & McDougall, 1994; Zahra & George, 2002; Knight & Cavusgil, 2004; Kuivalainen et al., 2007). Secondly, we explored the market scope in line with the literature, and measured it according to the number of geographical markets with which MSMEs are involved and have generated revenue (Zahra & George, 2002; Jones & Coviello, 2005; Kuivalainen et al., 2007; Andersson et al., 2014). Thirdly, we considered the speed of internationalization. Because there is no established conceptualization or measurement tradition for this variable, we refer it to the current ratio of foreign sales to total sales in relation to the number of years involved abroad (Jones & Coviello, 2005; Oviatt & McDougall, 2005; Kuivalainen et al., 2007; Andersson et al., 2014; Ziyae et al., 2014). Finally, the mode of internationalization was considered according to the particular combination of entry strategies applied by the MSMEs surveyed. Several alternatives of entry mode have been addressed in the literature and we have selected the main ones, including direct exports, indirect exports, e-commerce, licensing and

franchising, joint venture, and subsidiaries (Datta et al., 2002; Malhotra et al., 2003; Jones & Coviello, 2005; Brouthers & Hennart, 2007; Hashai et al., 2010; Andersson et al., 2014).

Results

In this study, special care was taken to ensure the validity and reliability of our measurements. Thus, to determine the adequacy of our measurement model we first investigated the internal consistency of the measured constructs through a reliability analysis. Results show a variable degree of digitalization and EO Cronbach Alpha values of more than 0.7, which is higher than expected by Hair and colleagues (2006). However, the variable of internationalization intensity has a Cronbach Alpha value of 0.401. Thus, instead of constructing a composite variable, as was the case for digitalization and EO, we did not create a mean score for internationalization intensity, but rather used single items of measurement. Finally, in our research, we also created composite variables consolidating the 9 items of EO under the three unidimensional constructs; innovativeness, proactiveness, and risk-taking (Covin & Miller, 2014). Table 1 introduces a description of the constructs and displays the results of the reliability analysis involving key variables.

In order to test our hypotheses and evaluate the relations between variables, we statistically relied on a regression analysis. On the one hand, we investigated the relationships that may exist between degree of digitalization and degree of EO for MSMEs, while, on the other, the relationships between decomposed EO factors and the internationalization intensity of MSMEs.

Hypothesis 1: Degree of Digitalization and EO

As a first step, a regression was calculated to predict the degree of EO based on the degree of MSMEs' digitalization. The regression results revealed that a company's degree of digitalization is positively and significantly related to its degree of EO ($\beta=.402$; $p<0.001$). This allowed us to validate our first hypothesis (H1). Since we were not interested solely in the general hypothesis that considers the average degree of digitalization, we operationalized based on four specific hypotheses to detail the results. In short, we considered it more significant to decompose EO factors in detail, and thus aimed to further deconstruct the process proposed in our research model by analyzing how the degree of digitalization of each pillar affects each EO

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Table 1. Descriptive statistics.

		Mean	Median	Minimum - Maximum	Standard deviation	Number items	Alpha value
Degree of Digitalization		2.15	2.00	1.00 – 4.00	0.723	4	.719
	• Process and infrastructures	2.35	2.00	1.00 – 4.00	0.940	1	-
	• People and culture	2.43	2.00	1.00 – 4.00	0.855	1	-
	• Digital sales	1.64	1.00	1.00 – 4.00	0.863	1	-
	• Customer involvement	1.92	1.00	1.00 – 4.00	1.072	1	-
Degree of EO		4.33	4.55	1.00 – 7.00	1.093	9	.828
	• Innovativeness	4.27	4.33	1.00 – 7.00	1.353	3	.678
	• Proactiveness	4.51	4.66	1.00 – 7.00	1.258	3	.664
	• Risk-taking	4.28	4.33	1.00 – 7.00	1.229	3	.845
Internationalization intensity	• Scale	55.47	62.00	5.00 – 100.00	34.822	1	.401
	• Scope	19.90	11.00	0 – 193	25.526	1	
	• Speed	3.68	2.08	0.18 – 30.00	5.022	1	
	• Mode	1.95	2.00	1.00 – 6.00	1.082	1	

component. In order to test these contributions, we subdivided three separate regression models. The first was calculated to predict EO innovativeness based on the degree of digitalization of each pillar. Results show that EO components are mainly affected by the degree of digitalization of the internal pillars. The relationship between digitalization of the firm's pillars and innovativeness highlights a positive effect of process and infrastructure ($\beta=.344$; $p=0.000$) as well as people and culture ($\beta=.308$; $p=0.001$). The second model investigated the construct of proactiveness. A similar pattern of results was found with the pillar process and infrastructure ($\beta=.318$; $p=0.003$) as well as people and culture ($\beta=.311$; $p=0.002$). We then calculated the last model with the risk-taking factor and found a tendential positive result with the pillar process and infrastructure ($\beta=.183$; $p=0.091$), as well as a positive relationship with people and culture ($\beta=.306$; $p=0.004$).

Hypothesis 2: *EO and the intensity of internationalization*

Regarding our second hypothesis, we also decided to use decomposed EO factors in order to provide a more relevant analysis, as well as to observe in more detail how innovativeness, proactiveness, and risk-taking affect the propensity of MSMEs' internationalization. The regression results highlighted that not all components of EO are significant predictors of MSMEs' internationalization, and revealed that none of the EO factors are a driver of scale and mode. Notwithstanding these first observations, the regression analysis for scope indicated a positive and significant relationship with proactiveness ($\beta=.270$; $p=0.010$) (H2b is supported). Finally, regarding the regression analysis for speed, we noticed a positive and significant relationship with risk-taking ($\beta=.270$; $p=0.039$) (H2c is supported).

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Discussion

This study was conducted with the objective of shedding light on relationships that link the dimensions of digitalization, EO, and internationalization of MSMEs. Although our results support the well-founded views from existing theoretical frameworks, the investigation of these dimensions within one process extend beyond conventional views that have only examined them separately. The central contribution of our study includes the introduction of a conceptual process that demonstrates how digitalization affects EO which, in turn, is a crucial determinant for increasing the internationalization propensity of MSMEs. As predicted, we found that the more MSMEs have digitalized some of their operations, the more they favor entrepreneurial behavior when leading their strategic decisions. Furthermore, in line with scholarly research, we verified that the more entrepreneurial behavior a company adopts in its foreign operations, the more it increases its internationalization intensity. More specifically, we observed that the number of geographical markets expands through proactive behavior and the speed of generating revenue in those markets accelerates through taking risky actions. Contrary to expectations, we found no relationship between EO components and the scale and mode of MSMEs' internationalization.

By elaborating on the results of our hypothesis testing, we first noticed that firms prioritize a digital transformation into their internal processes and infrastructure, as well as in building their employees' digital skills and digital-oriented culture. Nevertheless, MSMEs demonstrated fewer digitalization efforts in terms of the experience they provide through sales and customer involvement. Indeed, in line with previous research, the use of purely digital technologies in external features leads to defining a new value proposition, and in some cases, requires redesigning the company's business model (Bharadwaj et al., 2013; Pagani, 2013; Gray & Rumpe, 2015; Kane et al., 2015; Porter & Heppelmann, 2015; Ross et al., 2016; Schallmo et al., 2017; Sebastian et al., 2017; Autio et al., 2018; Aagaard et al., 2019; Kraus et al., 2019). Established MSMEs may require more time and resources to achieve such digital transformation, and may consequently focus on digitalizing internal features for operation optimization, cost reduction, quality improvement, and greater reliability (Ross et al., 2016). At the same time, whether at internal or external levels,

we observed in our results that the degree of digitalization has a significant impact on a company's EO, which, in turn, affects the internationalization intensity of MSMEs. The approach used in our research allows us to discuss the model of discovery and exploitation of opportunities through the use of purely digital technologies, particularly dedicated to established MSMEs.

Considering that we decided it was more relevant to observe the three unidimensional strategic orientations in our research separately, we propose organizing our discussion through each EO component. We first noticed a positive and significant relationship between the degree of digitalization and innovation behavior. Thus, from the perspective of innovativeness, we found that the digital context enables firms to strongly encourage collaboration, sharing of ideas, and new value creation. As emerging technologies have the ability to connect people to each other, connect people with machines, and connect machines to each other, broad business networks and communities are created around the world. And since digital technologies are interactive technologies, a flow of hyperconnectivity allows firms to improve their innovativeness by integrating new actors — customers, staff, partners, and even competitors — into their creative processes and experimentations. For instance, as the dimensions of space and time are changing, customers have become directly reachable through digital platforms, regardless of distance and time zones. People can therefore be integrated remotely into the process of designing, sharing ideas and experimenting.

Even if we did not find a significant relationship between innovative behavior and internationalization items, we are convinced about the benefits of digitalization to better enhance company innovativeness. New forms of collaboration involving innovation, co-creation, and strategic alliances will provide companies with additional resources and competences to develop international trade activities, and better adapt offers to foreign markets' expectations. To achieve this, technologies such as digital platforms, mobile applications, augmented reality, and 3D printers present innovative ways to personalize offers, build unique experiences with end-users, and even start activating nearby customers.

To build and fuel the wide range of digital technologies, the central point is the data (Witten et al., 2016). From a perspective of proactiveness, data is also a precious

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source of information for firms to improve their competitive position. In our research, we found a positive relationship between the degree of digitalization and the proactiveness of firms. We are convinced that data exists as a crucial resource for decision making. By collecting abundant data and processing it through predictive algorithms, firms can assess their current conditions, as well as future market attractiveness, and thereby improve their competitive position (Neubert, 2018). Available data can also be employed for the development of user-centric and knowledge-driven products and services. This is also a way to increase customization. Nowadays, while collecting data is a method for overcoming a lack of business knowledge, monitoring it is essential for shaping a company's environment, and adapting its strategic behaviour. With technological advances such as big data, internet of things, and machine learning, firms are improving their abilities to gather market knowledge, and taking a more proactive in their decision-making process. Better informed companies are more inclined to take dynamic actions to extend their product or service scope in foreign markets, and to engage in new niche markets. For example, they can experiment using several test versions directly with customers, who are able to give their opinions and feedback, or to share data on preferences and habits.

We are convinced that using digital technologies is a relevant method of overcoming international barriers as a way to pursue new market commitments, even without the certainty of success. Risk taking is thus the last entrepreneurial orientation that we found positively affected by the use of digital technologies. We suggest that if companies are better informed, they should be more inclined to make decisions that involve taking calculated risks. Despite the fact that entrepreneurs are often afraid of cyber-attacks, data loss, and other security issues involved in digital technology usage, we are nevertheless confident that these tools will develop more secure solutions in the years to come. For example, companies can use blockchain technology to secure financial and other business transactions. An open, distributed ledger can record transactions between two parties efficiently, in a verifiable and permanent way (Iansiti & Lakhani, 2017). This makes blockchain part of a sharing process between actors who must collaborate, even while they do not naturally trust each other. Mechanisms based on cryptography make the registry tamper-proof and the transactions immutable. From our results, we also demonstrated a positive relationship between risk taking and the speed of MSMEs'

internationalization. In our argument, we suggested that, by implying more direct and greater integration of data between actors, digital technologies increase immediacy, moderate the need for intermediaries, and consequently, speed up the pace of exchanges. In some cases, disintermediation may also result in reducing companies' dependence on location-specific value chain assets and resources.

In the light of these notable findings, we finally suggest that entrepreneurs should combine digitalization, EO, and internationalization activities through defining their own digital entrepreneurial internationalization strategy. Shaped by combining current capabilities with capabilities enabled by digital technologies, a new business strategy will directly impact the current value proposition of companies in foreign markets, and thus significantly reinforce their competitive advantage. According to the change in governance involved in digital contexts, we emphasize the key role of founders and decision-makers. We are convinced that the faster they understand the benefits of using digital technologies with a specific vision in mind, the faster they will develop the right mindset to achieve their transformation and increase their internationalization.

Conclusion

In this study, we conjointly examined three research streams from the field of entrepreneurship. The central contributions of our research include the introduction of a conceptual process that illustrates the relationships between degree of digitalization, EO, and the internationalization intensity of MSMEs. It highlights how the degree of digital transformation affects companies' EO, and measures how each EO component is linked to MSMEs' internationalization intensity. We relied on a quantitative research design based on Swiss internationalizing MSMEs, and statistically demonstrated that as firms become digitalized, this positively affects their EO degree which, in turn, positively contributes to increasing the scope and speed of their internationalization. Furthermore, to reinforce the results of our study, we discussed propositions that highlight how digital technologies could improve companies' EO, and thus enhance internationalization. In our argument, we considered that the digital context provides a wide range of opportunities for firms to become more innovative, aggressive and risk-taking in order to conquer new foreign markets. Indeed, by shaping spatial and temporal boundaries of entrepreneurial activities, digital technologies reduce

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many constraints for reaching the global marketplace. By consolidating EO capabilities with the use of nascent technologies, we suggested that firms have numerous opportunities to further activate their ecosystem, deepen market knowledge, develop stronger skills, optimize internal resources and better exploit external ones, improve operations, and shape new value propositions with greater flexibility and responsiveness. All of these elements, if dynamically explored, will lead companies to expand their competitive advantage in foreign markets.

Implications, limitations and further research

Although DE, EO, and IE have been widely addressed in scientific research, the value added from our research is in considering these dimensions as part of the same process. By testing a set of hypotheses, the study contributes to empirically confirming the relationship between digitalization and EO, as well as between EO and MSMEs' internationalization. We also made an important contribution to knowledge by outlining empirical evidence measuring the degree of companies' digitalization, and by emphasizing how founders can benefit from the decentralization of governance to exploit new opportunities. However, even though we have suggested that digitalization in internal dimensions involves less financial risk and effort in the short term, it would be relevant to examine in more detail how firms can transform their external dimensions and redesign their value proposition in light of digitalization. Because our empirical results were collected via Swiss MSMEs, this may raise concerns about the possibility of generalizing the results to other nations. To develop the conceptual process, we encourage further research to collect empirical evidence in other countries. Furthermore, in our research, no composite variable could be created based on the internationalization items. It would therefore be interesting, in a future study, to create a multidimensional construct of internationalization, and observe how it is related to EO.

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Digitalization and SMEs' Export Management: Impacts on Resources and Capabilities

Benjamin Dethine, Manon Enjolras, Davy Monticolo

“In a rapidly changing world, the only strategy that is guaranteed to fail is not to take risks.”

Mark Zuckerberg
Facebook CEO

Digitalization is becoming an increasingly central issue for companies. However, most companies, and in particular SMEs, are struggling to engage in a coherent global digital transformation process. Indeed, digitalization affects much of a company's organizational strategy, including the development of market opportunities. Digitalization has been identified as an element that fosters the internationalization of SMEs. However, the integration of digital technology requires investments and changes in a company's internal practices through the mobilization of new resources, as well as by implementing specific capabilities to manage them. The objective of this research work is therefore to examine the impact of SMEs' digital transformation on their internationalization capability. Relying on an extensive exploratory literature review, digital facilitators were identified and classified into three categories: e-commerce, e-marketing, and e-business. Then, a cross-analysis between the identification of digital facilitators from the literature and a framework of SMEs' export practices (the Potential Export Index, Enjolras et al., 2016) was conducted in order to highlight differentiated impacts that can be theoretically identified. The most impacted export practices are related to the strategic vision of the firm, the customization of its offerings, its network dynamic, and its internal organization. E-commerce facilitators concern the supply chain organization, e-marketing facilitators are related to communications and customer relations, and e-business facilitators impact the company as a whole.

Introduction

Over the past decade, the emergence of increasingly powerful digital technologies and digital infrastructures have transformed and continue to transform business processes, organizations, and corporate culture with new innovation processes, marketing models, and types of products/services (Tekic & Koroteev, 2019).

One field of literature in particular has further studied the implications of digitalization for improving the international capabilities of companies. International activities have been identified as one of the most important levers for economic growth (Bo kunow, 2019). They involve several advantages for companies' development, but also imply certain challenges, especially for small and medium enterprises (SMEs) because of their size and limited resources (Bhatia & Thakur, 2018). In this specific context, digital tools and technologies can be considered as facilitators for

mobilization in order to achieve SMEs' international business objectives (Safar et al., 2018).

The objective of this paper is to examine the impact of SMEs' digital transformation on their internationalization capability. Specifically, this research identifies digital facilitators, defined as tools, technologies, skills, or capabilities that a company can implement in order to improve its internationalization process. Taking as a methodological basis the Potential Export Index, as a framework for good export practices (Enjolras et al. 2016), the impact of digital facilitators on these practices is assessed through a bibliographical review. This theoretical analysis highlights potential contributions in the digital age as a way of potentially answering to international challenges faced by SMEs. This research is therefore based on an explorative approach that aims at building a theoretical research object in view of later empirical work to follow.

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Literature Review

SMEs and Internationalism

Internationalization can be defined as a process of increasing company commitment to international markets. It can occur in several modes: exporting, importing, foreign investment, opening of subsidiaries, and other things. In the scientific literature, the particular case of SMEs remains the subject of numerous publications that use different approaches to explain the processes of international commitments.

A widely used approach is the step-by-step process. Internationalization is then considered as a linear, sequential, and progressive process (Coviello & McAuley, 1999). Within this step-by-step approach, two paths coexist: The Uppsala model (Johanson & Vahlne, 1992) emphasizes the notions of a learning process and psychological distance. The innovation model (I-Model) (Bilkey & Tesar, 1977) considers internationalization as a process comparable to the adoption stages of a new product. However, there is a large body of literature that questions the step-by-step approach to internationalization and, in particular, criticizes the idea that firms (especially SMEs) must follow a specific gradual path to internationalize (Anderson & Narus 1990; Coviello & McAuley, 1999). Some studies highlight that the several stages of an SME's internationalization process are not always gradual. They are instead characterized by rapid increasing, decreasing, and re-increasing commitment to foreign markets (Dominguez & Mayrhofer 2017). Moreover, the concept of necessary "stages" is also refuted by the immediate internationalization process of the so-called "born-global firms," which involve international activities from the company's creation (Knight & Cavusgil 2004). This phenomenon could be explained, among other ways, by the development of digital technologies that allow SMEs to enter the international market more quickly and easily (Loane et al., 2004).

The second approach for mobilization is the network approach, which sees internationalization as a network that develops through trade relations with other countries (Johanson & Mattsson, 2015). The emphasis in this case is put on the relational capacities of the company.

Finally, the so-called economic approach, as supported by Penrose (1959) and in line with a resources-based view (Barney, 1991), suggests that certain resources are

critical. These resources are crucial in influencing the growth of the company and therefore its ability to penetrate new markets. A lack of these resources (financial, human, time) can thus limit companies' international activities. In this approach, the focus is rather on organizational capacities (production capacities, financial capacities).

Thus, several models of internationalization coexist within the literature. The economic approach highlights the importance of firms' organizational capacities, and more particularly, their capacity to mobilize strategic resources. The network approach considers that internationalization requires the development and mobilization of the relational capacities of a firm. And finally, the step-by-step approach highlights the importance of the learning capacity to overcome psychological distance specific to the internationalization process. These various points of view refer to aspects that an SME must consider in order to develop beyond its national territory (Laghzaoui, 2009).

The internationalization process is therefore complex and involves major disruptions within companies. This is why most SMEs face difficulties in developing an effective international strategy. For example, most SMEs adopt a short-term strategy in comparison with larger companies (Moeuf et al., 2018). Moreover, they face internal obstacles related mainly to their small structure and limited resources (Cerrato & Piva 2012). Leonidou (2004) considers that SMEs' difficulties are either external, and therefore related to the business environment (domestic or foreign market), or internal, and therefore related to the resources, organizational capacities, and vision of the company. Indeed, the main internal constraints for SMEs are lack of financial resources (Bellone et al. 2010; Paul et al. 2017), lack of time and/or skills (Freeman et al. 2012; Paul et al. 2017), and lack of knowledge about foreign markets (Bianchi & Wickramasekera, 2013). In the same vein, Costa et al. (2020) consider that SMEs face two particular difficulties in their internationalization processes: to establish a customers' network as a way of gaining competitive advantages in foreign markets, and to identify and manage the right information.

On the other hand, SMEs have a flatter and less bureaucratic structure than larger companies since they have a simpler internal organization that usually allows them to adapt quickly to change (Wang et al., 2017). Despite their limited size, SMEs often have active

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relationships with their networks, which are one of their most important sources of knowledge in an international context (Hsieh et al., 2019).

These sources of knowledge and the quantity of data to handle have increased with the arrival and growth of digitalization. In the next section we will explore issues of digitalization for the SMEs.

SMEs and Digitalization

Academics and industry are used to the term "digital transformation" as a key term to express organizational changes influenced by digital technologies. However, while a clear definition has not been widely adopted, all the scientific articles are nevertheless unanimous in expressing the fact that digital transformation induces a radical change in organizations (Burki, 2018). According to Lucas et al. (2013), these changes concern adjusting business processes, creating new organizations, changes in organization/customer relationships, markets, user experiences, and the number of customers, and finally, the impact of disruptive technologies. In addition, the acceleration of digital technological development, combined with the increasing globalization of associated economies, is accelerating the innovation cycles of products and services, and generating new business models, while also changing the operational and organizational environment for businesses and consumers.

Thus, companies from all business sectors are exploring and experimenting with new ways of using digital tools and technologies within their organizations. New digital technologies, such as data analysis, digital communication, connected objects, intelligent systems, and user experience through digital technology, are being applied in all sectors of activity, including many traditional industries (Pagani et al., 2017). Moreover, some researchers have observed the advantages of digital technology in companies (von Leipzig et al., 2017; Rojo Abollado et al., 2017; Bedell-Pearce, 2018; Subramaniam et al., 2019), and that companies which have started their digital transformation are more competitive and thus able to more easily adapt to changing ecosystem conditions.

However, despite the importance attached to this phenomenon, most companies, in particular SMEs, are struggling to engage in a coherent global digital transformation process. Indeed, the integration of digital technology requires investments and changes in a company's internal practices as a whole, which

sometimes requires the implementation of new internal organizational strategies as well as the development of new skills. SMEs generally invest in digital technologies on an ad hoc basis, operating in an opportunistic manner, yet without following any real global digital transformation strategy. This approach, which focuses on a short-term vision, sometimes results in investment errors, and often in incremental development rather than in the development of a profound transformation that maximizes value creation associated with digital transformation of the entire company.

Financial barrier to internationalization are common for SMEs, along with the risk of losing investments. Von Leipzig et al. (2017) show that, in addition to financial obstacles, a lack of technology and skills related to digitalization, as well as a poorly structured strategy, can also constitute a missed opportunity for digital transformation. As Goerzig and Bauernhansl (2018) explain, the human side must always be considered. They define "digitalization" as the interconnection between a company, its product or service, and human beings. In SMEs, organizational development is driven by their employees. This is reflected in the strategy that a SME takes involving the human factor as being of primary importance, since it will directly influence the digitalization actions by staff.

In this context, SMEs need to be prepared to adapt to their new technological environment in order to remain competitive or even to engage with new markets (Safar et al., 2018). SMEs need guidance in developing their digitalization strategy in order to keep pace with technological developments. This can happen by prioritizing actions to enable an effective and efficient digital transition (Goerzig et al., 2018). Digital transformation therefore represents a new type of challenge for SMEs, requiring a global digital transformation strategy that impacts the entire company organization. What results from this approach will be not only a specific product or new service, but also the development of a capacity to adapt to changes induced by technological innovations related to digitalization. In the next section, we will describe the consequences of digitalization in the internationalization process of SMEs.

Internationalization and Digitalization: towards a joint resource/capability perspective

Digitalization and internationalization are both well-documented research areas. However, the relationship between these two themes remains relatively fuzzy,

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particularly in the specific context of SMEs. Even with a growing trend among SMEs of utilizing the Internet for internationalization (Jean & Kim, 2019), there is still a lack of studies addressing the influence of digitalization on the internationalization management of SMEs (Costa et al., 2020).

Studies addressing this topic highlight that firms may consider digitalization as a means of enhancing their international capabilities (Lee & Falahat, 2019), even if the effects might be indirect. Regarding the impact on internationalization processes, Dutot et al. (2014) observed that SMEs adopting a more complex form of internationalization often have more developed IT capabilities. Moreover, digital tools could specifically benefit SMEs by improving an SME's ability to compete with larger organizations through operating on an international scale (Louw & Nieuwenhuizen, 2019), thus compensating for a weaker physical presence in foreign markets.

However, these studies generally focus on the importance of digital technologies in support of SMEs' international activities (Brouthers et al., 2016). In particular, these studies acknowledge the resource-based view, for which digital technologies constitute a strategic resource in Barney's sense (1991), and which can give a company a competitive advantage (Lee and Falahat, 2019). Thus, digital resources are strategic if they are valuable (value creation), scarce, not easily transferable or inimitable, and not substitutable (Barney, 1991). From this point of view, the relationship between digitalization and international activity is regularly considered from a techno/process point of view, but its operational implementation is often little explored.

According to Cassetta et al. (2019), the internal context in which digital tools/resources are adopted within SMEs is often ignored. Thus, companies fail to consider digital technology decisions as an integral part of their business practices (Chatzoglou & Chatzoudes, 2016). However, the organizational impact of digitalization on SMEs is crucial, and must be reflected in a combination of tools/resources, skills, and capabilities. Digital resources can therefore be considered strategic only if good implementation or exploitation of them within the company is considered. The identification and exploitation of strategic resources still requires the implementation of specific capacities.

As an example, Guidici and Blackburn (2013) explore

the digital/international relationship from a dynamic capability perspective (Teece et al. 1997), through the specific topic of digitally-enabled network intermediation as factor for a SME's internationalization facilitator. Resources may directly be related to capability, putting forward the benefits of a combination between the resource-based view and the capability view.

Based on these statements, it seems interesting to explore the relationship between digitalization and internationalization of SMEs, not just in terms of facilitating resources but also in terms of capabilities. This way the impacts of digitalization on the internal practices of companies may be considered, as well as the changes induced in their internationalization process.

Methodology

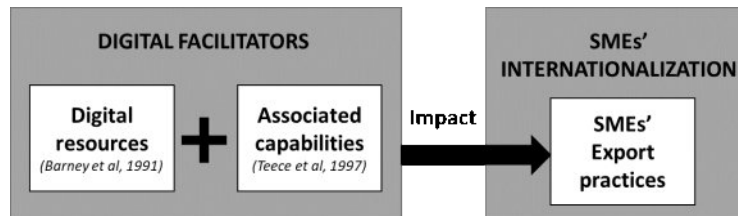
Research Design

Based on theoretical statements in the previous section, the research question of this work aims to answer the following question: *how can digitalization potentially impact SMEs' international practices?* Relying on a joint resources/capability-related vision, this analysis proposes considering digitalization as leverage for the internationalization of SMEs, through facilitators defined as a combination of digital resources and associated capabilities. We believe facilitators should make it possible to implement resources and capabilities in a company's internal practices. Based on the definition of Teece et al. (1997), we define an associated capability as a firm's ability to integrate, build, and reconfigure internal and external digital resources to address changes related to its international development.

Because of the large scope of literature in the international field, and the various entry modes into international markets, the scope of this study was reduced to a specific internationalization mode: export. Exporting is indeed one of the most common ways to enter a foreign market in the early stages of SME internationalization (Jones 2001; Majocchi et al. 2005). This refers to companies that position their products and services outside the geographical borders of their country of origin. The internationalization mode for export-oriented companies is preferred because it requires the lowest level of commitment and risk (Laufs & Schwens, 2014). In view that SMEs have a predominantly centralized method of functioning (Torrès & Julien 2005), it seems less risky and challenging

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Figure 1. Research design



for a small business to export themselves than, for example, to set up a subsidiary abroad.

Finally, this study follows a joint perspective that combines resources and capacities. Thus, the evaluation of the impact of digital facilitators on SMEs' internationalization is based on an analysis at the internal company level. The study's objective is first of all to identify how digital facilitators (resources and capabilities) both strengthen the export practices of companies and support internal changes (Figure1). The impact on export performance is beyond the scope of this study.

Methodological Background: The Potential Export Index (PEI)

This research work relies on an empirically based diagnosis tool for SMEs' export capabilities: a Potential Export Index (PEI) (Enjolras et al., 2016; Enjolras 2017). This index measures a company's maturity regarding six dimensions (strategy, openness, adaptation of the

offer, organization, human resources, and management) spread across 22 export management practices (Figure 2).

Based on a maturity grid, the diagnosis describes a company's behaviour in terms of export-related internal practices. It provides a diagnosis of a company's current situation by identifying its strengths and weaknesses. The PEI relies on a robust empirical base (Enjolras et al., 2016) that has been tested with SMEs at the international level (Enjolras, 2017). This diagnostic tool does not evaluate export maturity on the basis of performance indicators (for example, export turnover, or number of foreign markets); instead it measures the degree of maturity of internal practices within a company. Indeed, while many export performance diagnostic tools exist (Alaoui, 2013; Marzouk and Bouslama, 2016), few attempt to identify organizational practices that promote exports. Attention to metrological positioning allows for identifying the potential impacts of digital facilitators on the maturity of a SME's export practices

STRATEGY	OPENESS	EVOLUTION OF THE OFFER	ORGANIZATION	HUMAN RESOURCES	MANAGEMENT
Strategic vision	Technological / Commercial Intelligence	Product or Service Adaptation	Roles and Responsibilities	Language Skills	Administrative Preparation
Value chain	Networks and Partnerships	Communication	Opportunity Development	Diversity and International	Contract Follow-up
Financial Agility	Influence / Lobbying	Business Model	International Deployment	Learning and Skills Management	Capitalization and Feedback
Intellectual Property		Distribution system	Production Organization		
			Operational Adjustment		

Figure 2. The Potential Exportation Index (PEI) framework and practices and sub-practices

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and likewise enables the proposition of a joint resources/capabilities-related vision of the digitalization/internationalization relationship.

Methodological approach

This research is based on an exploratory deductive approach. The objective is to build a theoretical research object in view of later empirical work to follow. Indeed, according to Saunders et al. (2003), an exploratory research approach can either be a goal in itself, or constitute part of the research upstream of a subsequent testing process. Thus, our methodological approach aims at identifying and clarifying the relations that exist between digitalization and internationalization within SMEs, from a joint resource/capability point of view, based on a theoretically exploratory study.

Therefore, we define a four-step method:

- 1) **Extensive bibliographic research:** A bibliometric analysis was conducted using a keyword research algorithm: “SME* AND digital* AND (international* OR export*).” Only “article” document types were considered and only papers written in English between 2000 and 2020 were used. This first bibliographic analysis was performed on the Web-of-Sciences database and provided a total of 40 corresponding papers. Next, the relevance of each paper was checked, according to its research area. This refining process resulted in the exclusion of papers from unrelated areas of research such as medicine, biology, and law. 21 papers were then retained for the next step.
- 2) **Exploratory keyword analysis:** identification of keyword clusters defining thematic dimensions addressed by literature analyzing the digitalization/internationalization relationship within SMEs.
- 3) **Systematic literature review:** A deep analysis of each considered paper was performed in order to identify digital facilitators favoring the international development of SMEs.
- 4) **Cross analysis of the digital facilitators and the SMEs' export practices:** Each facilitator was analyzed according to the PEI (Potential Export Index) practices framework. A systematic comparison of facilitators with all export practices was undertaken to identify potential impacts, for

which we then sought validation through bibliographic support.

Results

Explorative keyword analysis

The literature review led to the identification of 21 relevant articles that analyse the relationship between digitalization and internationalization of SMEs. A keyword analysis was first carried out in order to identify dimensions according to which the digitalization/internationalization relationship is addressed. Thus, an occurrence map made with VoS Viewer software that allowed us to highlight the most common keywords within the 21 selected articles (Figure 3).

Our analysis of this map highlights different dimensions. First of all, some keywords are related to the research design of publications: mobilized theories (resource-based view and capability approach, as identified in the previous theoretical section) and methodological positioning (model, action research). The second dimension refers to performance-related keywords: benefits, impact, competitiveness. This dimension confirms the challenge of digitalization and internationalization for SMEs as a growth factor.

The third dimension concerns the structural and contextual factors addressed in the publications: specific business sectors (aviation, services) and the economic or contextual particularities of companies (export entry mode, emerging economies). This dimension highlights focus on the digital/international relationship from a contingent perspective in the sense of Mintzberg (1979). Certain external and structural factors make this relationship specific to the context in which companies operate, where differentiation could be envisaged.

The fourth dimension concerns keywords relating to the types of digital tools that can be used, supporting a technology-oriented point of view: digital marketing, e-commerce, and big data. The fifth dimension, meanwhile, highlights keywords relating to the functioning of companies and their organizational practices: management, innovation, knowledge, strategy, collaboration. These keywords are connected to the notion of capabilities and address changes induced by digitalization and internationalization within companies.

The coexistence of these last two dimensions highlights

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the interest of combining resources (tools) and capabilities (practices) for the study of the digital/international relationship within SMEs.

literature review and cross analysis

Based on the explorative keyword analysis, a systematic literature review was performed within the 21 selected publications, in order to identify relevant facilitators acting on the export management of SMEs. Then, each facilitator was confronted with our export-theoretical framework, in order to identify its impact on the internal practices of companies' export management.

Based on this systematic literature review, Table 1 puts forward the potential impact of digital facilitators on the export practices of SMEs. Each correspondence is based on (a) bibliographical source(s) enabling it to be validated theoretically. To propose a clarified vision of the potential impacts of digital facilitators on export management practices, Table 1 is structured through a three-type categorization of the digital facilitators considered (Mazzarol 2015):

- e-commerce facilitators generally refer to the use of digital platforms to undertake transactions consisting of selling goods and services via the internet.
- e-marketing facilitators refer to the use of digital

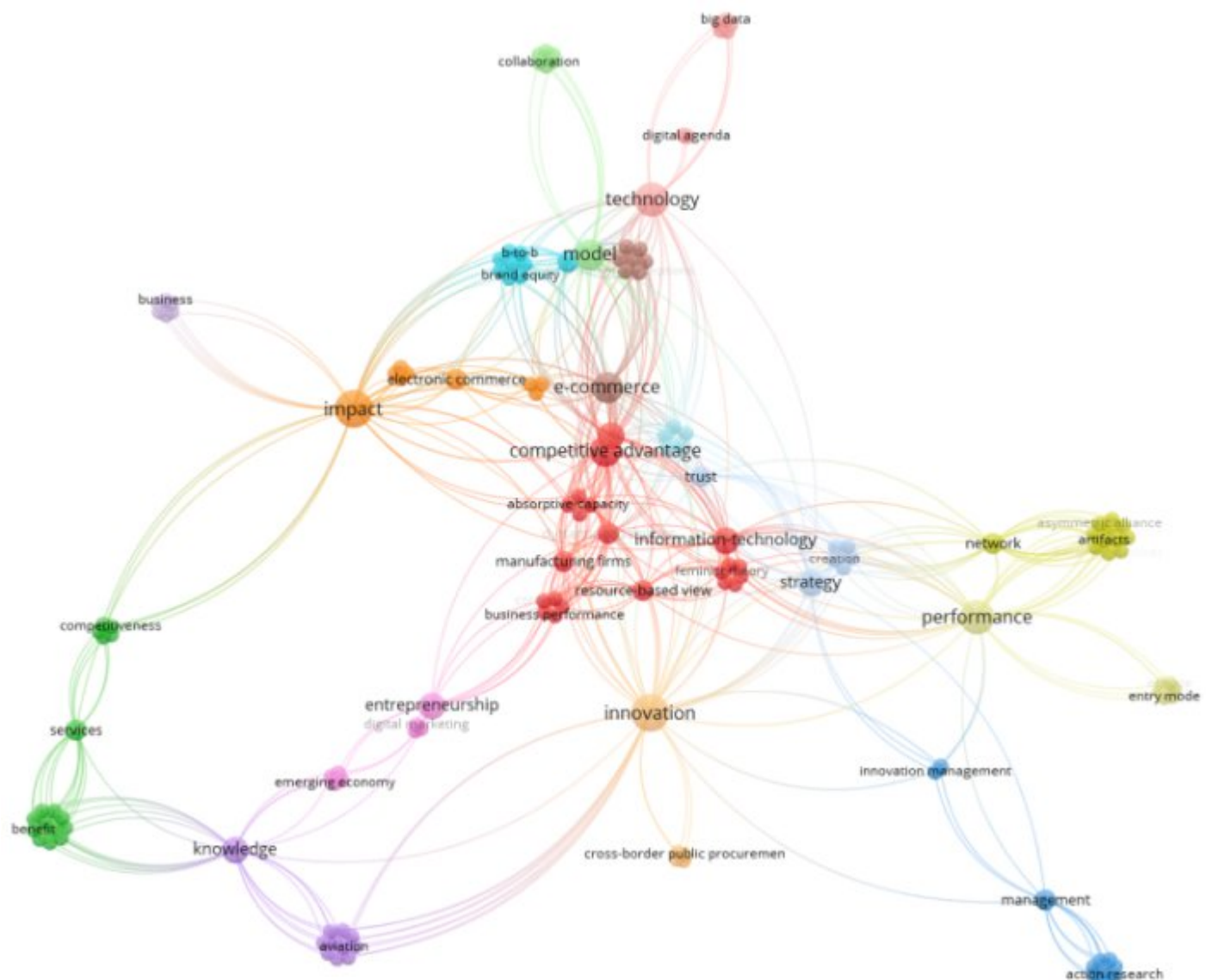


Figure 3. keyword occurrence map

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channels to undertake marketing and promotion.

- e-business facilitators refer to the use of digital analytics tools to enhance production processes and internal management.

Each facilitator is represented in Table 1 with a specific color, indicating the category it belongs to. Some facilitators can be classified in one specific category, while others show a multidimensional impact. This explains why some facilitators can belong to several categories. The numbers indicated in Table 1 refer to a bibliographic source justifying the impact of the digital facilitator on the export practice considered. All references considered in Table 1 are listed in Table 2.

Discussion

The cross-analysis between digital facilitators and export management practices puts forward several findings. First, Table 1 shows that digital facilitators impact the export management practices in a global way.

The most impacted practices are related to:

- the relationship with value chain stakeholders: suppliers, distributors, partners
- adapting the offer: product, communication, business model
- business intelligence: commercial, technological, competitive watch
- the strategic vision
- operational adaptation
- knowledge management and capitalization

However, some practices are not impacted or only very slightly impacted by the digitalization facilitators identified. Financial agility seems not to be connected with the digitalization of companies. Intellectual property is also not a determining factor, along with influence or lobbying practices. Finally, operational practices related to language skills and administrative preparation seem also not to be heavily impacted by digital facilitators.

Thus, the impact of SMEs' digitalization on their export management practices seems global, while our analysis put forward a focus on strategic and organizational practices. Operational and structuring practices, such as human resources management or administrative processes, are significantly less impacted.

This analysis highlights a differentiated impact according to the facilitators' orientation. Relying on a three-type categorization– e-business, e-commerce, and e-marketing facilitators– it was possible to identify several dimensions where digitalization fosters SMEs' export management practices in a differentiated way.

First, the e-commerce facilitators, aiming at carrying out functions such as business to business (B2B) and business to consumer (B2C) transactions, mostly impact practices related to supply chain management (supplier/distributor relationships), networking (partnership and influence), communication, as well as business model definition through the implementation of a specific price policy (Table 1). These are particularly related to the export practices of an organization and the development of a company's offerings. Thus, e-commerce facilitators seem to act as levers to overcome or reduce operational difficulties encountered by SMEs in foreign markets by acting on the order of selling and distribution processes, as well as structuring commercial offerings through online transactions.

Based on the findings from our systematic literature review, e-commerce facilitators notably contribute to reducing the distance and entry costs related to involvement in international markets by providing an additional channel for sales. In a general way, e-commerce digital tools improve supply chain efficiency by enabling the automation of internal related processes, along with providing real-time information about inventory, production, sales, and distribution issues (Astuti & Nasution, 2014). E-commerce adoption also has a direct impact on a firm's business model, more particularly, on its pricing policy definition (Cassetta et al., 2019). By decreasing costs associated with spatial distance and export intermediaries (Arenius et al., 2005), e-commerce provides a business model optimization opportunity as well as a close and direct connection with clients (Astuti & Nasution, 2014).

However, e-commerce adoption also represents a risk-taking decision because of potential damages to technical systems and data files, financial loss, reputation threats, loss of productivity, and loss of confidential customer information (M. Rahman & Lackey, 2013). This is why, among other things, SMEs are less engaged in e-commerce initiatives than their larger counterparts.

Secondly, the e-marketing dimension refers to the use of digital facilitators to undertake marketing and

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Table 1. Cross-analysis facilitators/export practices

FACILITATORS	STRATEGY				OPENESS			EVOLUTION OF THE OFFER				ORGANIZATION					HUMAN RESOURCES			MANAGEMENT		
	Strategic vision	Value chain	Financial Agility	Intellectual Property	Technological / commercial intelligence	Networks and partnerships	Influence / Lobbying	Product or service adaptation	Communication	Business model	Distribution system	Roles and Responsibilities	Opportunity development	Internal Deployment	Production Organization	Operational adjustment	Language skills	Diversity and International	Learning and skills management	Administrative preparation	Contract Follow-up	Capitalization and feedback
eBusiness																						
eCommerce																						
eMarketing																						
ERP	1 /13	1 /13	13								1	1	1		1				1		1	1
Cloud computing						1		19	19			1										1
E-procurement		1			6										1							
Learning digital technologies																	3		3			3
Internet of things		9									9				9 /20	20 /16						9
Robotics															20	20						
Process improvement DT		3													3							3
Digital Balanced Scorecard										19												
Product development DT		3						3														
Collaborative network					13	13 /15		13		13		13			13	13		13				
Digital platforms		4 / 2			2	4 / 2							2									2
Information and Communications Technologies	14	4 / 11 /14 /20			18 / 17	4 /17 /16		11 /17	11 / 13 14 / 20 19 / 17	16	11 /19			14						11	11	
DATA								8	8	8												
Digital service								11	8					11								
Technological skills																			20			
Digital technologies	16				16			16 / 15	16		16		15	15	16			16	16		16	
Digital tools		12				12 /16			16		16			16		12		12				
Internet transaction							8		8	1	8			8								
Online selling										1						1						
Website		1				1 / 7			1 / 7 / 9					16		1						
Internet Access	5	5			8	5			5		5 / 8					5						
Digital marketing								18	18	18												
CRM	10				10	10		1 / 10	1 / 10				1 / 10	1 / 10		10						1 / 10
Social media	5	5		5	1 / 5	1 / 5		1 / 5	1 / 5		5		5	16		1		1 / 5	9			5
Market intelligence	5					15	15	8 /15	15	8 /15				5								

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Table 2. bibliographic references from the cross-analysis

1	Cassetta, E; Monarca, U; Dileo, I; Di Berardino, C; Pini, M	The relationship between digital technologies and internationalisation. Evidence from Italian SMEs
2	Eric Costa, António Lucas Soares, Jorge Pinhode Sousa	Industrial business associations improving the internationalisation of SMEs with digital platforms: A design science research approach
3	Lee, YY; Falahat, M	The Impact of Digitalization and Resources on Gaining Competitive Advantage in International Markets: The Mediating Role of Marketing, Innovation and Learning Capabilities
4	Heim, I; Kalyuzhnova, Y; Li, WZ; Liu, KC	Value co-creation between foreign firms and indigenous small- and medium-sized enterprises (SMEs) in Kazakhstan's oil and gas industry: The role of information technology spillovers
5	Eid, R; Abdelmoety, Z; Agag, G	Antecedents and consequences of social media marketing use: an empirical study of the UK exporting B2B SMEs
6	Munoz-Garcia, C; Vila, J	Value creation in the international public procurement market: In search of springbok firms
7	Louw, C; Nieuwenhuizen, C	Digitalization strategies for SMEs: A cost vs. skill approach for website development
8	Andersen, PH	Export intermediation and the internet: an activity-unbundling approach
9	Trasca, DL; Stefan, GM; Sahlian, DN; Hoinaru, R; Serban-Oprescu, GL	Digitalization and Business Activity. The Struggle to Catch Up in CEE Countries
10	Roopchund, R	Exploring Social CRM for Development of SMEs in Mauritius
11	Gatautis, R; Vitkauskaitė, E	eBusiness Policy Support Framework
12	Bahri Korbi, F; Said, K; Chouki, M	What role(s) can artifacts play in improving mutual understanding between partners within asymmetric alliances?
13	Jardim-Goncalves, R; Agostinho, C; Sarraipa, J; Grilo, A; Mendonca, JP	Reference framework for enhanced interoperable collaborative networks in industrial organisations
14	Marcinkowski, B; Gawin, B	A study on the adaptive approach to technology-driven enhancement of multi-scenario business processes
15	Pergelova, A; Manolova, T; Simeonova-Ganeva, R; Yordanova, D	Democratizing Entrepreneurship? Digital Technologies and the Internationalization of Female-Led SMEs
16	Joensuu-Salo, S; Sorama, K; Viljamaa, A; Varamaeki, E	Firm Performance among Internationalized SMEs: The Interplay of Market Orientation, Marketing Capability and Digitalization
17	Igartua, JI; Retegi, J; Ganzarain, J	IM2, a Maturity Model for Innovation in SMEs
18	Wasowska, A	Organisational-Level Attributes of Micro-Multinationals. The Evidence From European SMEs
19	Chen, YYK; Jaw, YL; Wu, BL	Effect of digital transformation on organisational performance of SMEs Evidence from the Taiwanese textile industry's web portal
20	Cook, D	RICS futures: turning disruption from technology to opportunity
21	Kazlauskaitė, R; Autio, E; Sarapovas, T; Abramavicius, S; Gelbuda, M	The Speed and Extent of New Venture Internationalisation in the Emerging Economy Context

promotion (Mazzarol, 2015). It leads to higher profits, enhanced market share, and growing brand equity (Eid & El-Gohary, 2013). According to the cross-analysis, e-marketing facilitators are numerous and impact more or less all export management practices. However, a bigger impact appears for export practices related to

openness (networking and business intelligence), strategy (building of a strategic vision and intellectual property management), and developing the company's offerings through adapting the traditional 4 Ps of the marketing mix: Product, Promotion, Price, and Place.

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Thus e-marketing facilitators can be used to reach several objectives. First, these facilitators foster the online communities of the firm's customers, through the use of social media, among other things, to increase the strength and frequency of the firm's interaction with customers (Roopchund, 2019; Eid et al., 2019; Pergelova et al., 2019). They also enable the collection and integration of customer information from various sources, as well as the usage of this information to assess customer value and engagement. Electronic interactions indeed enable firms to acquire new customers, to retain existing customers through improved customer satisfaction, and to up-sell their products through better and timely customer knowledge (Guidici & Blackburn, 2013).

However, Ghalandari (2013) shows that the positive relationship between e-marketing facilitators and a company's export capabilities has a higher impact on international markets when digital tools are employed for communications development, instead of only for information search and sales activities. The ability to conduct online meetings or to speak directly to customers strongly reduces social and cultural distance. It also improves the company's understanding of its customers' views and needs, while disseminating a strong brand awareness (Eid et al., 2019). Nevertheless, it is widely believed that "remote" meetings cannot ever fully replace the "personal touch" (Tseng & Johnsen, 2011).

We find it interesting to note that e-marketing facilitators are able to lower technological barriers regardless of a firm's size and resources. While large firms have been the early adopters and beneficiaries of most marketing innovations, an increasing number of SMEs are also rapidly adopting digital innovations to extend their market bases, and remain competitive (Kim et al., 2013). For example, a recent report revealed that the emergence of online platforms, such as Facebook and LinkedIn, offer low-cost options for SMEs to connect with foreign customers and facilitate their internationalization (Manyika & Lund, 2016). This is why a social approach to Customer Relationship Management (CRM), through website and social media, appears to be a relevant and productive strategy to engage customers in a collaborative conversation, in addition to monitoring traditional customer-business interactions.

However, viral network effects typical of more consumer-oriented social media do not seem to be

validated in a B2B environment. In this specific context, a fear of losing control and an unwillingness to share valuable information appear to hold back SMEs. This reduces the use of online B2B platforms in particular (Guidici & Blackburn 2013; Costa et al., 2020). This can be explained by the fact that the end-customer context (B2C) is more emotionally reactionary, than the B2B market, where the interactions tend to be more rationally strategic. Thus, the B2B context involves co-creation and innovation from an industry- or process-specific point of view, whereas the B2C context concerns service- or design-oriented innovation in particular (Iankova et al., 2019). This strongly modifies the way companies communicate and share information. However, e-marketing remains an impactful facilitator in the B2B context, because it allows a strong network strategy to facilitate communication processes, and effective brand and image promotion (Kim et al., 2013).

Finally, e-business tools are important for SMEs in order to keep track of impacts and implications, and to develop the distinct capabilities needed to reach international markets (Grandon & Pearson, 2004). According to our cross-analysis, e-business facilitators are the most representative and impact export practices in a global way. Relying on the definition of e-business facilitators above, the global impact factor makes sense because digital tools aim at supporting the global organization of firms (Mazzarol, 2015). Therefore, the impact of e-business facilitators on the export management of SMEs is spread across all internal components of a SME's organization. If a stronger impact seems to appear for practices related to supply chain management (relationship with suppliers, distributors, operational adaptation, production adaptability) and to networking practices, nevertheless a strong impact also appears for knowledge management practices, through information capitalization and feedback.

Thus, digital e-business facilitators provide consistent support for information management, by providing better and easy acquisition of information about foreign markets through new channels of information (Cassetta et al., 2019; Trașcă et al., 2019; Costa et al., 2020). They also foster information sharing between companies' internal stakeholders and potential partners, by enabling actors to make their own contents available using digital collaborative platforms (Costa et al., 2020). Entering into this collaborative approach, companies and their partners are involved in activities that require group coordination, behavioural adaptation, and alignment

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between the objectives of the group and individual actors. Digital tools are strong facilitators to foster these kinds of practices. For example, Bahri Korbi et al. (2019) explain that the adoption of digital artifacts (common databases, videoconferencing, teleconferencing, screen sharing) by strategic partners leads not only to the establishment of a common working language, but also to a decrease in the degree of inter-organizational uncertainty, and improvement in mutual understanding. These elements are particularly relevant in an international context because they reduce the risk of conflict, mitigate cultural differences between partners, and even turn into an asset for the alliance (Trabelsi, 2016).

These findings are particularly true in the specific case of high-tech SMEs that are more used to supporting their internationalization process through intelligence gathering activities, to investigate and expand their connections across a worldwide business network (Loane, 2005). Digital technologies indeed play an increasingly important role in the search for complementary partners within the overall supply chain (Guidici & Blackburn, 2013).

Moreover, the use of digital channels such as social media enables a company to recruit employees (Trașcă et al., 2019). Employees are also users of and contributors to digital content provided by companies on the internet. So, it is crucial that they understand the impact of digitalization on business and undertake training for improved competences (Kim et al., 2013).

Digital tools also provide an additional channel for increasing knowledge of foreign markets and potential competitors (Cassetta et al., 2019) through a strong process of market, technology, and economic intelligence (Jardim-Goncalves et al., 2013; Wąsowska, 2017; Joensuu-Salo et al., 2018; Igartua et al., 2018). As an example, public e-procurement systems appear as a relevant channel for companies in terms of business intelligence. Policymakers generally pay little attention to dissemination procedures and formats. Consequently, information on awarded contracts is provided through various e-procurement and transparency portals. This may improve a company's tendering capabilities and reduce difficulties faced by SMEs in winning public contracts.

Finally, from a process optimization viewpoint, digital e-business facilitators such as cloud computing, robotics, Internet of Things (IoT), mobile services,

Supply Chain Management (SCM), and Enterprise Resource Planning (ERP) applications, serve to enhance internal production processes (Cassetta et al., 2019). They foster companies' capabilities to improve flexibility in manufacturers' supply chains, reduce cycle time, and deliver products to customers in a timely manner (Jardim-Goncalves et al., 2013; Cook, 2015; Trașcă et al., 2019).

Thus, the role of e-business facilitators is rather different from e-commerce and e-marketing because they contribute to changing production and internal management processes, as well as to supporting partners' integration in the supply chain.

Conclusion

This article aimed to study the relationship between digitalization and internationalization of SMEs. More specifically, this research work identified the theoretical impacts of digital facilitators on companies' export practices. Adopting a joint vision between the integration of digital resources and their usage through specific capabilities, digital facilitators were identified in the literature and classified according to three categories: e-business facilitators, mainly concerning online transactions, e-marketing facilitators, that aim at promoting and communicating; and finally e-business facilitators, concerned with the modification of a company's internal organization, as well as its supply chain. A cross-analysis of data collected was carried out using best export practices from the PEI framework as a basis for comparison. The objective of this cross-analysis was to identify potential impacts of facilitators on SME practices. The cross-analysis was carried out with the help of an extensive literature review.

This research highlighted various impacts according to the type of facilitators (e-commerce, e-marketing, and e-business) and export practice considered. Indeed, the most impacted export practices are those related to the strategic positioning of companies, the adaptation of their offerings, openness, and organization. Operational practices related to the export process are less impacted. Moreover, the facilitators with the most global impact are e-business facilitators, as they directly concern a company's internal functioning and modify its processes as a whole. E-marketing facilitators also have a strong impact, but are more focused on practices related to communication and customer relations.

Thus, this study showed various impacts of digitalization

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on SMEs' export management. However, these results have some limitations and open the way to several different research perspectives. First of all, this research was based entirely on an exploratory review of the literature, which made it possible to construct a theoretical object of study, but which requires empirical validation. This work therefore represents a first theoretical step to be confirmed and confronted in the field. In addition, this study was carried out on the basis of a bibliography focused on SMEs, containing a rather limited number of scholarly articles. An analysis generalized across all companies could be a means of visualizing the differences between the digital practices of SMEs and those of larger companies. Indeed, some digital facilitators are easier than others to set up for small business structures and, in this context, the acceptability of the digital facilitators deployed, both in terms of the resources that can be mobilized and the skills that can be implemented, is an issue to be considered further with analyses of the impact of digital systems on export practices. Prioritization for such studies could be envisaged to limit the effort required while optimizing the impacts. Finally, we chose to focus our analysis on exports. However, digital technology is a valuable asset to be mobilized in the case of more advanced internationalization modes, for example, opening a subsidiary abroad or establishing a joint venture. It would be interesting to broaden the scope of this study, to also take into consideration these modes of internationalization. Finally, a study on "born-global" SMEs can also be envisaged.

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Digitalization and SMEs' Export Management: Impacts on Resources and Capabilities

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The Importance of Global Business Hubs on Internationalizing SMEs: an empirical analysis of psychic and geographic distance.

Pascal Wild

“ The new technical capabilities associated with ICT, and some components of the work of states, have together constituted scales other than the national as strategic today. ”

Saskia Sassen, Professor,
Columbia University

This article investigates the influence of psychic and geographic distance, as well as country and market-related variables, on the preference of high-technology small and medium-sized enterprises (SMEs) to connect with, and settle in major business hubs. Literature in the field of SME internationalization and international entrepreneurship increasingly emphasizes a network approach in which the characteristics and linkages of the internationalizing firm's network are studied. We aim to contribute to this network-based internationalization research by integrating a further element present in complex social and technical networks: network hubs. Hubs are highly connected nodes within a network. In global business, hubs can be defined as business sites that have a high interconnection with the world economy through tremendous flows of goods and capital. The empirical findings of our research suggest that internationalizing high technology SMEs tend to connect with, or settle in to foreign market business hubs, when focal markets are more distant from their home market. These findings are significant for both geographic and psychic distances between home and focal markets.

Introduction

Small and Medium Enterprises (SMEs) are considered the backbone of most economies since they account for a large majority of firms and employ a large amount of the working population. This is the case for North America, Europe as well as for China, where SMEs account for 99% of firms. They employ two-thirds of the workforce in the case of the first two, and 80% in the case of China (Arnone & Deprince, 2016; Munir et al., 2017; SBA, 2020). In recent years, many SMEs have dramatically increased their involvement in international business activities. This is particularly true for the many highly innovative producing and servicing SMEs from so-called small and open economies (SMOPECs), such as Australia, Switzerland and the Scandinavian countries, in which the limited size of the home market does not ensure enough potential for growth and survival. In Switzerland, for example, most internationalizing SMEs with less than 250 full-time equivalents belong to highly technical and innovative producing and servicing sectors, such as engineering, chemicals, and medical technologies

(Baldegger & Wild, 2019). Through the wildfire growth of the internet and IT businesses in the early 1990's, the internationalization of SMEs was amplified even more. Compared to larger-sized traditional multinational enterprises (MNEs), SMEs often lack sufficient resources and capabilities when they want to engage in international trade (Talebi et al., 2017). Holmlund and Kock (1998) explain that in various aspects, such as managerial, supervisory, production, and employee levels, SMEs lack the skills and expertise needed in order to be involved in international trade.

Extant literature on SME internationalization discusses distance as a major liability for a firm to enter new markets (Johanson & Wiedersheim-Paul, 1975; Johanson and Vahlne, 1977; Erramilli, 1991; Baldegger and Wyss, 2007; Ojala & Tyrväinen, 2007). In traditional views oriented on MNEs than internationalizing SMEs, distance is perceived to raise transaction costs, and bring uncertainty due to lacking information about local foreign market conditions (Rugman & Verbeke, 1993; Mark Casson 2013). The neoclassical approach is based on an underlying assumption that firms are

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acting in a fully rational behavior and maximizing their income by perfectly exploiting markets. Additionally, it did not take the rising population of small internationalizing organizations into account (Wild, 2018). Nevertheless, trade liberalization, better communication, and internet-related business opportunities lead to a rising number of ever more global start-ups and SMEs.

Contemporary approaches to SME internationalization are instead based on a behavioral theory of the firm (Johanson & Vahlne, 1977, 2009), and analyze the patterns of SME internationalization from a process and network perspective. The network perspective focuses on non-hierarchical systems where firms invest in international activities in order to strengthen or defend their network position (Rialp & Rialp, 2001). In this approach, a network is seen as a dyadic business relationship formed between two or more actors (Anderson et al., 1994; Senik et al., 2011). It is assumed that understanding the role played by the set of ties in which a small firm is embedded will contribute to a better explanation of its international behavior (Styles et al., 2006; Zain & Ng, 2006; Al-Laham & Souitaris, 2008; Johanson & Vahlne, 2009; Jones et al., 2011; Galkina & Chetty, 2015). Networks are discussed as they influence a SMEs ability to recognize international opportunities (Chetty & Campbell-Hunt, 2004; Coviello, 2006; Gilmore et al., 2006; Galkina & Chetty, 2015; Zhang et al., 2016). They are also assumed to influence the speed and performance of a SME's internationalization process (Musteen et al., 2010; Hohenthal et al., 2014).

In the traditional Uppsala model from the 1970's, also known as the Nordic school, SME internationalization was considered as a gradual, stepwise process in which both commitment to foreign markets, as well as the distance of the foreign marketplaces, seemed to steadily increase (Johanson & Vahlne, 1977). Starting mostly in geographically and culturally close (proximate) markets, the acquisition of experiential knowledge and organizational learning was assumed to be crucial to a SME's progress into more and more distant foreign markets (Johanson & Vahlne, 1977). In Johanson and Vahlne's (1990, 2003, 2009) subsequent contributions, the authors shifted away from a firm-centric approach towards a network-perspective. This paradigm shift was caused as a result of growing evidence for a new type of internationalization behavior, which was challenging the identified patterns of the Nordic school. Some SMEs, in particular highly innovative and competitive ones, seemed to skip important steps of the gradual

process, and instead turn into internationally or globally operating companies within a short time interval (Oviatt & McDougall, 1994; Knight & Cavusgil, 1996). Many of the SMEs that were observed in the early 90s, belonged to the growing ICT branch, and could be classified as Start-ups. Their international or global scope of business activities was inherent from inception or very soon thereafter, and thus these firms were labelled as "born global" (Madsen & Servais, 1997; Moen, 2002), global start-ups (Oviatt & McDougall, 1994), instant exporters, instant global entrepreneurship (McAuley, 1999; Katz et al., 2003), or international new ventures (McDougall, 1994; Zahra, 2005), just to name a few definitions.

The network formation process along with entrepreneurial social interactions were cited among the main reasons for this particular type of internationalized SME (Oviatt & McDougall, 1994; Bell et al., 1998; Zahra, 2005; Zhou et al., 2007). Zahra (2005) argued that these firms' networks provided them with better international opportunities. Freeman and co-authors (2006) highlighted the importance of an entrepreneur's private network ties that allow born-global firms to access important foreign clients. For Zhou et al. (2007), the home-based social networks of born-global companies provides them with advice and experiential learning, as well as trust and solidarity, in addition to knowledge about foreign market opportunities.

In their revisited Uppsala model, Johanson and Vahlne (2009), took account of these phenomena and fully revised their view of SMEs' internationalization process according to a network perspective. They replaced the firms' market commitment by its network position, and justified this change with the following arguments: *"we now assume that the internationalization process is pursued within a network. Relationships are characterized by specific levels of knowledge, trust, and commitment that may be unevenly distributed among the parties involved, and hence they may differ in how they promote successful internationalization"*.

However, despite the increased emphasis of a network perspective on SME internationalization, understanding the role of SMEs' network characteristics remains partial and fragmented (Bruneel & De Cock, 2016; Stoian et al., 2017; Ribau et al., 2018). Hence, numerous scholars have begun to construct empirical and theoretical applications for more fundamental theories about social networks (Knox et al. 2006; Ellis,

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2011; Galkina & Chetty 2015; Masiello & Izzo, 2019; Yamin & Kurt, 2018). We aim to contribute to this work by introducing an important element of complex social networks to the network-based research on SME internationalization, namely, with the notion of “network hubs”. Therefore, we first discuss the concept as well as the role of network hubs in global business. Then, we linking the current theories on network hubs with the process of SME internationalization, in which the relevance of distance plays an important role and is starting to be discussed heavily. We then state our hypotheses based on empirically tests involving the case of 609 internationalizing hi-tech SMEs from Switzerland.

2. Theoretical overview and hypothesis development

Hubs are an important element in theories about complex social networks. Barabasi and Reka (1999) discovered that most social networks share the common feature of a power law distribution in which the number of connections rises exponentially. They argued that most of the world’s real networks are open systems in which the number of new vertices to the system are continuously increasing throughout the lifetime of the network. Instead of connecting randomly, new vertices tend to connect to nodes that are already well connected. Hence, the preferential attachment of new vertices to already well-connected vertices. Previously this was called the ‘Matthew Effect’ by Robert K. Merton (1968) regarding the effects of accumulated advantage in scientific research. It is also described as “the rich are getting richer” phenomenon (Caldarelli et al., 2002), which leads to the development of highly connected hubs in social as well as technical networks (Barabasi & Reka, 1999).

Hubs are an important subject of research in the field of economic geography. In this field of research, they describe the centre for certain kinds of industrial activity, for example research (Philip et al., 2015), financial activities (Poon et al., 2015), car assembly (Edgington, 2015), or others. Mostly, these centres are concentrated in a geographically limited area, that is densely populated by firms and individuals, such as a city. Such territorial nodes, essential to the sustainable development of world trade and financial flows along the global value chain, are defined by contemporary literature in economics and sociology as “global cities” (Sassen, 1994, 2005; Friedmann, 1995). Due to their high concentration of foreign MNCs and affiliates, such cities provide an exceptional density of highly specialized service firms such as lawyers, financial institutions, and

advertising agencies, and bring together various types of entrepreneurship capacities linking their hinterland to regional and world markets (Friedmann, 1995; Scott, 2001; Olds & Yeung, 2011). At the heart of global city research lies a seemingly paradoxical trend, that is increasingly being confirmed over the last three decades: economic activities are getting dispersed around the world, while simultaneously control and command functions over these activities have been ever more centralised and integrated into some leading cities (Sassen, 1991).

2.1. Connectivity and SMEs links to global business hubs

The global control exercised by MNCs in their headquarters has made possible the emergence of a variety of producer and financial services (Alderson & Beckfield, 2004). Globally operating service-providing firms in the fields of Accounting, Advertising, Banking and Finance as well as Law, so-called Advanced Producer Services (APS) offer worldwide assistance to MNEs for executing their power and control (Hoyler et al., 2008; Pereira & Derudder, 2010; Jacobs et al., 2011; Taylor, 2012). These APSs are MNEs themselves, and in that sense, they locate their business wherever they detect a certain demand for the services they provide. By collecting information about an APS’s global network of branches, information on the global dispersion of major MNEs, and where global control is exercised can be obtained. Hence, various scholars have traced intercity networks within these globally acting MNEs (Taylor et al., 2002; Taylor, 2001, 2012; Hoyler et al., 2008). Following this line of thought, a roster of global cities can be drawn on a geographic map of globalization, that maps the office locations of these global APS firms servicing MNCs. Thus, a city’s connectivity is the product of service values (the number APS headquarters and their importance in their respective firm hierarchies) inherent in that city.

Connectivity might therefore not only be of interest for MNCs, but also for internationalizing SMEs. Some evidence for this exists in studies on international entrepreneurship. Acs and co-authors (2008) observed higher entrepreneurial activity in global cities when compared to the rest of a country’s locations. Iammarino and McCann (2015) pointed out that for internationalizing companies, location is key in order to maintain access to the latest technologies and trigger interorganizational innovation. In turn, they also observed the important economic impact that subsidiaries of international firms have on the city in which they settle. Considering the liability of

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internationalizing SMEs given by their limited resources, lack of skills and competencies in foreign markets (Eriksson et al., 2006; Domingues & Mayrhofer, 2017), these firms' demand for external services might increase with geographic expansion (Ruzzier & Antoncic, 2007; Senik et al., 2011). Following this line of thought, we argue that internationalizing SMEs might primarily be connected to global cities (hereafter called global business hubs), functioning as global business hubs that host many highly specialized service-firms. Thus, we state the following hypothesis:

H1: The higher the connectivity-rate of a global business hub with the world economy, the higher the share of foreign internationalizing SMEs using the hub's business networks.

2.2. Geographic distance and SMEs links to global business hubs

Geographic distance is a significant factor in the selection of firms' target countries for internationalization. According to the Nordic school of entrepreneurship, distance increases the uncertainty about an outcome of an action. In that regard, a gradual internationalization process does not only occur through increasing involvement of foreign activities, but also in an increasing the distance between home and foreign markets (Johanson & Vahlne, 1977).

Despite the rising phenomenon of international new ventures (INVs), gradually internationalizing firms still tend to be the norm. According to Clark and Pugh (2001), the first three foreign countries that British firms enter markets in are significantly closer geographically than subsequent ones. The same was observed among SMEs in New Zealand that tend to enter the nearby Australian market first, before venturing towards more distant ones (Chetty, 1999). Even among sectors with a relatively high population of INVs, such as the software industry, evidence was found that they enter first into countries geographically proximate. This is due to the fact that most software products require intensive relationships with the customer, which is favoured through short geographic distance (Moen et al., 2004; Ojala & Tyrväinen, 2006). Ojala and Tyrväinen (2006), concluded after in-depth literature review of distance related to SME internationalization, that closer countries have a more familiar environment in terms of language, culture, and business practices, which makes it is less expensive to operate in nearby countries.

Considering the literature, we suggest the necessity for

internationalizing SMEs to connect to spatial network hubs rises with geographic distance between home and focal markets. The high density of APS firms and intellectual capital available in global business hubs does not uniquely enable MNEs to headquarter as a way of exercising their control and command functions. There is likewise benefit with distant internationalizing SMEs if they connect effectively with important foreign market actors. Thus, we hypothesize that internationalizing hi-tech SMEs in geographically distant markets are more likely to be connected to market network hubs, either by having their own representation office, or by third-party firms that serve as representatives. With this line of thought, we state the following hypothesis:

H2: The greater the geographic distance between a SME's home and focal market, the higher the share of foreign internationalizing SMEs that dispose over network links to the focal market's global business hub.

2.3. Psychic distance and SMEs links to global business hubs

The concept of psychic distances in relation to the internationalization of firms dates back to the works of Beckerman (1956), and studied patterns of intra-European trade. Psychic distance, defined as the sum of "factors preventing or disturbing the flows of information between firm and market" (Johanson & Wiedersheim-Paul, 1975), increases the more a company is confronted with unfamiliar or even unknown market conditions. Differences in language, laws and rules, persist, but triggers of psychic distances are also considered according to cultural and social milieu.

Dow (2000) describes the effects of psychic distance on an internationalizing firm as decreasing after having dealt with the first foreign markets, while it remains an important and decisive factor in a company's process of market selection. The cultural framework of a society frames all kinds of economic activities within the society, and influences both policies and regulations (Williamson, 2000; De Clercq et al., 2014). This difference already impacts internationalization projects for physically close markets (O'Grady & Lane, 1996). Considering the context of a middle-European country such as Switzerland, many rather physically close countries such as in Northern Africa or Eastern Europe, nevertheless dispose a high psychic distance, whereas physically distant markets such as Australia and New

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Zealand remain in a rather close psychic distance to their home market (Wild, 2019). While analyzing patterns of internationalization among SMEs from New Zealand, Chetty and Campbell-Hunt (2004) found that next to the geographically nearby market of Australia, New Zealand's SME prefer to internationalize into the rather distant market of the United Kingdom, instead of into closer markets of (Latin and North-) America or on the Asian continent. The main reason for this is the closer psychic distance they have to British markets.

Considering the literature, we suggest that the necessity of internationalizing SMEs to connect with spatial network hubs rises with the psychic distance between home and focal markets. SMEs in psychically distant markets need supportive assistance that is to be found in its highest density in the business networks of global cities. Thus, we hypothesize that internationalizing hi-tech SMEs in psychically distant markets are more likely to be connected through the markets' network hubs, either through their own representation office, or by third-party firms:

H3: The greater the psychic distance between a SME's home and focal markets, the higher the share of foreign internationalizing SME that dispose over network links to the focal market's global business hub.

2.4. The empirical model

The figure below depicts two independent variables, geographic and psychic distance, that positively influence the dependent variable, labelled Global Business Hub Ratio. The dependent variable is the ratio

of SMEs with a connection to major global business hubs, among those who declared having business activities in the related world region. We consider a relative share of SMEs, since most of them disperse their activities among a few world regions without being a "truly" global player (Baldegger & Wyss, 2007; Onkelinx & Sleuwaegen, 2010; Baldegger & Wild, 2019).

Controls were included for the effect of political freedom as well as the city population of the global business hub. The effect of political freedom on a nation's economy has been the topic of many debates. The level of a nations' political freedom indicates the extent to which its citizens are granted civil liberties and political rights (Gastil, 1991). Individuals who dispose over a high degree of political freedom must live in a nation that allows them to participate in the formation of public policies (Gibson, 1993), benefit from freedoms of speech, press, expression, and assembly (Dheer, 2017), and exercise their legal rights (Wu & Davis, 1999).

Since economic, social, and political uncertainty in a society are generally decreased through the existence of political freedom, some scholars have described the positive effect on an economy of increased competition and venture creation (Goodell & Powelson, 1982; Sirowy & Inkeles, 1990). Investment, whether local or foreign, is encouraged through democratic governments that offer protection of property rights and low taxation (Axiala & Fabro, 2009). Further empirical evidence supports this argument stating that more political freedom also increases entrepreneurial activity and enhances economic growth (Scully, 1988; Kurzman et al., 2002; Doucouliagos & Ulubasoglu, 2008).

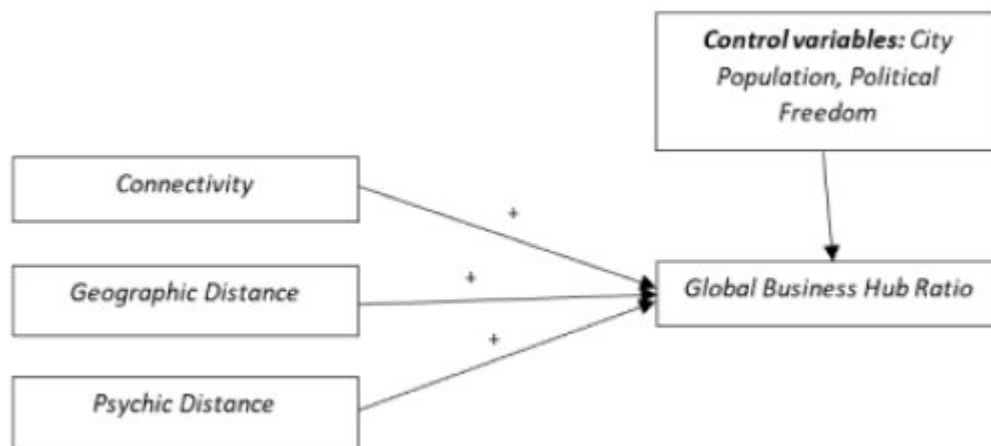


Figure 1. Proposed model of the relative share of SMEs with network links to a global business hub (Internationalizing SMEs per hub)

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The population of a city is, on one hand, an indicator of the market size in a business-to-customer market. Internationalizing firms tend to invest where the market size is of a certain importance. On the other hand, empirical evidence exists of a positive correlation between the size of a population and opportunities for new business formation (Van Stel et al. 2005; Acs et al. 2008).

3. Methodology

To test these three hypotheses, data was compiled from four different sources: (a) the Swiss International Entrepreneurship Survey (SIES) of 2016, (b) Hofstede's (2001) cultural indices database, (c) Freedom House's political freedom index dataset, and (d) the database on cities' population from the United Nations (2019) population division.

The SIES dataset comprised data on internationalizing SMEs in Switzerland that were collected in a cross-sectional study design in 2016. The SMEs were controlled for the following criteria: (a) minimum of 5 and a maximum of 249 employees, (b) headquartered in Switzerland, and (c) minimum of 20% turnover in foreign countries. The data was provided by Dun & Bradstreet business intelligence and led to a total of 609 valid respondent SMEs. In the following sections, the model's variables are explained in more detail.

3.1. Dependent variable

The *global business hub ratio* represents the percentage of firms composed of direct and/or indirect links to a world region's global city, which are among the companies that generate turnover in the relative world region. Direct links mean that the company has direct representation, such as an owned branch, point of purchase, or office space. Indirect links are third-party firms that represent SMEs, such as a trade or a sales intermediary and partner-firms. This measure is calculated for every global city rated as Alpha by the GaWC (2012). In the SIES, the surveyed SMEs are indicated on a matrix of fourteen world regions and an ordinal scale of six categories based on "share of foreign sales as a % of total revenues" and how much revenue is generated in each world region. The companies were counted as being "active" in a world region if they generated a minimum of 5% turnover from it.

Global Business Hub Ratio = [number of SMEs indicating direct and/or indirect links to a global business hub] /

[number of SMEs indicating turnover from a global business hub's world region]

The subregions as defined by the United Nations Statistics Division (UNSD), based on M.49 standard area codes for statistical purposes (United Nations, 2018), were grouped into twelve major world regions. The stages of economic development as defined in the Global Competitiveness Report (Schwab et al., 2016) served to enable subdivisions and groupings of these subregions.

3.2. Independent variables

Taylor (2001) made an attempt to calculate the measure of cities' connectivity with the global economy. The variable named "connectivity" is the product of service values for a city with each other city for all APS firms. The data collection for this variable was carried out by the GaWC utilizing 100 office networks of service firms in accounting, advertising, banking/finance, insurance, law, and management consultancy that operate globally (Taylor, 2001). These firms were chosen due to having offices in at least 15 different cities in the major globalized regions of Northern America, Western Europe and Asia-Pacific.

The service value for firm j in city i is allocated v_{ij} , and m is the APS firm. The basic rational unit of measurement defining the relation between cities a and b in terms of firm j is given by:

The aggregate cities' interlock between cities is given by:

$$\Gamma_{abj} = V_{aj} V_{bj}$$

For each city there are $n-1$ such interlocks and the network connectivity for a city is given by:

$$\Gamma_{ab} = \sum_j r_{abj}$$

Where C is the network connectivity of city a .

$$C_a = \sum_i r_{ai} \text{ where } a \neq i$$

With this formula, city a is related to all other cities within the network through its companies. It measures the integration degree of a city into the world city network.

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The geographic distance between Switzerland and global business hubs was measured using the linear distance between Zurich, Switzerland's biggest and economically most powerful city, and the respective global cities. The value represents the distance in Kilometers.

Among the measures used in international business and multinational enterprise literature, we find principally Sethi's (1971) clustering of world markets, and Hofstede's cultural difference dimensions (Dow, 2000). The most extensive and comprehensive empirical research done to date on the cultural dimension relevant to work organizations is probably the one conducted by Hofstede, published in 1980 and 1984 (Benito & Gripsrud, 1992). The fact that Hofstede collected his data within a large multinational enterprise and for more than fifty subsidiaries made the data relatively robust. Only employees in similar occupations from the same multinational enterprise were compared. This gave him the opportunity to control for bias from different occupational positions and organizational practices (Hofstede, 1980, 1984; Benito & Gripsrud, 1992). As pointed out by Kogut and Singh (1988), Hofstede's work is impressive in its sample size and with the reliability of scores over time. He found that differences between national cultures vary along four dimensions: uncertainty avoidance, individuality, power distance, and masculinity-femininity. The codification of cultural traits along numerical indexes made it possible to compare relative differences between countries. In the composite index, as established by Kogut and Singh (1988), the deviation along each of the four cultural dimensions builds the starting point for measuring the distance. The deviations are corrected for differences in the variance of each dimension, and then arithmetically averaged (Kogut & Singh, 1988; Benito & Gripsrud, 1992). Cultural distance CD_j is the product of the following equation, as used in this study:

$$CD_j = \sum_{i=1}^4 [(I_{ij} - I_{iN})^2 / V_i]^{1/4}$$

where

I_{ij} = index value for cultural dimension I of country j ;

V_i = variance of the index for dimension i ;

N = home country

3.3. Control variables

City populations were added to the model in order to control for effects due to the size of a global business hub. The measures were selected from the 2014

database of the United Nations (United Nations, Department of Economic and Social Affairs, Population Division, 2014).

The most commonly used index in order to measure political freedom in countries is provided by Freedom House (Dawson, 1998; Far et al., 1998, Gerring et al., 2005). Accordingly, political freedom is measured along the dimensions of political rights and civil liberties. Political rights include the population's possibility to vote, participate in fair elections, and their general involvement in political decision making. Civil liberties capture equality of opportunities, freedom of expression, assembly, religion and so forth. The average value of both indexes was calculated and implemented as a control variable. Since each index is measured on a scale between 1 and 7, where 1 denotes the highest level of freedom and 7 the lowest, the original index values were reversed such that higher numbers denote higher levels of political freedom. The data on these indices was collected for the ten years between 2003 and 2012 whereas their correlation varied from $r=0.95$ to 0.98 ($p<0.001$). Hence, a high reliability of this measure was ensured.

4. Analysis and results

The results of the descriptive analysis already highlight the importance of distance when measuring the relative proportion of foreign internationalizing SMEs per world region, linked to global business hubs. An examination of Pearson's correlation suggested that connectivity ($r=0.001$, $p = n.s.$) did not associate significantly with the dependent variable. Hence, the variable did not fulfil the assumption of a linear relation with the dependent variable, and has thus been dropped out of the model. Geographic distance ($r=0.652$, $p<0.01$) and psychic distance ($r=0.544$, $p<0.01$), on the other hand, are both positively associated with the global business hub ratio. Political freedom ($r=-0.497$, $p<0.05$) is negatively associated with the predicted variable. The covariate population ($r=0.652$, $p<0.01$) is also positively associated to the global business hub ratio.

The values for skewness and kurtosis for all explaining variables are between -2 and $+2$, and therefore considered acceptable in order to assume normal univariate distribution (George & Mallery, 2010). Multicollinearity was checked by examining the variance inflation factor (VIF) values for all independent and control variables included in the regression models. The VIF values for all variables were below 10.0 (Deer,

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Table 1. Descriptive statistics of Pearson's correlations

Variables	1	2	3	4	5
Population	1				
Connectivity	0.207	1			
Geographic Distance	0.457*	-0.031	1		
Political Freedom	-0.127	0.123	-0.231	1	
Psychological Distance	0.084	-0.247	0.165	-0.814**	1
Global Business Hub Ratio	0.652**	0.001	0.652**	-0.497*	0.544**
Min	682.00	0.44	221.80	1.50	8.92
Max	36'834.0	1.00	16'565.9	7.00	70.41
Mean	10'675.08	0.66	5.52	1.72	28.14
Standard deviation	8'746.50	0.14	1.99	0.94	16.87
N	23	23	23	23	23

*Correlation is significant at the 0.05 level (two-tailed); **correlation is significant at the 0.01 level (two-tailed)

2017). Tolerance values denote variability in independent variables that are not explained by other independent variables (Özgener & Iraz, 2006). The tolerance for all independent and control variables was above the cutoff of 0.10 (Lin, 2008). According the results, problems of multicollinearity are unlikely. The maximum VIF score is 1.96 for control variable corruption, while testing political freedom as a predictor for the global business hub ratio.

The model was tested using hierarchical multiple regression analysis. Results are provided in Table 2. At the first step (baseline model 1), only control variables were included in the regression equation. Overall regression for this first model was highly significant ($R^2 = 0.60$, $F(2, 20) = 15.01$, $p < 0.001$). Global city population ($\beta = 0.60$, $p < 0.001$) and political freedom ($\beta = -0.42$, $p < 0.01$) were found to have significant effects on the global business hub ratio.

In model 2 the measure for geographic distance was included in the regression equation along with the control variables. Geographic distance was found to have significant effect ($\beta = 0.37$, $p < 0.05$) on the global business hub ratio. The overall regression in this second model was highly significant ($R^2 = 0.70$, $F(1, 19) = 15.08$, $p < 0.001$), with a significant change in R square over the baseline model ($\Delta R^2 = 0.10$, $p < 0.05$). Both covariates,

global city population and political freedom, were found to have a decreased significant effect on the ratio of Swiss SMEs in global cities of $\beta = 0.44$, at a 0.01 level, and $\beta = 0.36$, at a 0.1 level (2-tailed).

Model 3 examined the effect of psychic distance on SMEs choices to link their business in a major global city. The overall model was highly significant ($R^2 = 0.67$, $F(1, 19) = 12.71$, $p < 0.001$) with a significant change in R Square over the baseline model ($\Delta R^2 = 0.07$, $p < 0.1$). Psychic distance was found to have a significant positive effect ($\beta = 0.45$) on the significance level of $p < 0.1$. Both covariates had a significant positive effect on the predicted variable. Global city population had a positive effect of $\beta = 0.61$ ($p < 0.1$) whereas the negative effect of political freedom was reduced to $\beta = -0.06$ at a significance level of $p < 0.1$.

Model 4 represents the final model with both, physical and psychic distance included in the regression results. Political Freedom has a minor significant and very weak positive effect of $\beta = 0.02$ on a significant level of $p < 0.1$, whereas the second covariate population had a significant positive effect of $\beta = 0.44$ ($p < 0.01$). Both physical and psychic distance positively affect the global business hub ratio by $\beta = 0.38$ ($p < 0.01$) and $\beta = 0.46$ ($p < 0.05$). The overall regression in this model was highly significant ($R^2 = 0.78$, $F(2, 18) = 7.08$, $p < 0.001$), with a

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Table 2. Regression results for the global business hub ratio

Predictors	Model1 (baseline)	Model 2	Model 3	Model 4
Political Freedom	-0.42**	-0.36*	-0.061	0.021
Population	0.60***	0.44**	0.61*	0.44**
Geographic Distance		0.37*		0.38**
Psychic Distance			0.451	0.46*
Constant				
N	23	23	23	23
Mean model VIF	1.02	1.21	2.33	2.15
R Square	0.60	0.70	0.67	0.78
R Square Change		0.10*	0.07**	0.18***
Adjusted R Square	0.56	0.66	0.62	0.73
F	15.08	15.08	12.72	15.62

*Significant at the 0.05 level (two-tailed); **significant at the 0.01 level (two-tailed); ***significant at the 0.001 level (two tailed); 1 significant at the 0.1 level (two-tailed)

meaningful change in R square over the baseline model ($\Delta R^2 = 0.18$, $p < 0.01$).

To conclude, we believe that H2 and H3 are confirmed given the significant positive correlation between geographic and psychic distance and the global business hub ratio. H1, which argues that a global business hub's connectivity influences the number of SMEs that internationalize to the world region and that are linked to its hub needs to be rejected. It has not been adequately tested in this study, since the major assumption of a linear relation with the dependent variable was not fulfilled.

5. Discussion and Limitations

By analyzing empirical data, this study focused on the importance of global business network hubs in global cities for internationalizing hi-tech SMEs. On the one hand, previous theory suggested that SME internationalization towards distant and culturally unfamiliar markets requires a preceding process of incremental learning in nearby foreign markets (Clark & Pugh, 2001; Moen, Gavlen, & Endresen, 2004; Ojala & Tyrväinen, 2006). A strong position in powerful business networks, on the other hand, explained the rapid processes of SME internationalization, such as of INV's or Born- and Re-Born-global firms (Zahra, 2005; Zhou et al. 2007). The debate on whether a rapid process of internationalization from INVs, mostly shown by SMEs and Startups in fields such as ICT, hi-tech, or (specialized) services, fits with a gradual and stepwise model as depicted in the Nordic school, seems to be clarified by the arguments of Johanson and Vahlne

(2009) and their network-view of the internationalization process. Accordingly, SME internationalization takes place in business networks that are "borderless". Hence, the liability of "outsidership" (coming across as an "outsider" to the relevant business networks) weighs heavier on internationalizing SMEs than any intercultural issues given by "foreignness" (being not a "national", but rather a "foreigner" and thus not familiar with local language and business habits).

The authors also argue that despite the phenomena of born globals with respect to INVs, most internationalizing SMEs are rather "regionals, with international activities that do not really span the globe in any significant fashion". We believe that the network characteristics of internationalizing SMEs, whether INVs or gradually internationalizing companies, significantly changes as their business expands towards more geographically and psychically distant regions. Complex social networks execute over network hubs, with strongly interconnected nodes, while the number of nodes counted in a network hub rises with its increasing complexity (Barabasi & Albert, 1999; Albert et al. 2000; Leppin et al. 2018). SMEs with geographically widespread business activities, such as in the case of the hi-tech SMEs we studied in Switzerland, need to operate along a far-reaching and complex business network in which geographic and intercultural distances are long. The internationalizing SMEs' burden of mediating intercultural differences and managing tangible and intangible resources across geographic distances and time zone remains, despite the borderless characteristic of international business networks. This supports our

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conclusion that the importance of global business hubs for such SMEs is actually rising.

In an ever more interconnected global business environment, sociologists as well as economists observe the rise in importance of densely connected cities for the global economy (Brenner, 1998; Sassen, 2000, 2004; Acs et al., 2008; Scott & Scott, 2011; Martinus & Sigler, 2018). In analyzing the role of global business hubs for internationalizing hi-tech SMEs, we empirically observed that greater distance between home and focal markets raises the relative proportion of foreign SMEs that pursue business activities in a region, and that are actually connected to business actors located in the hubs. Whereas the mere connectivity of a business hub does not influence the presence of internationalizing SMEs, both geographic and psychic distance seem to increase their number. In a network-view in which geographic and psychic distances seem to play a less important role, we actually believe that they influence SMEs' necessity to connect to business actors in global business hubs. This helps them to overcome the liability of network outsidership and increase their access to international opportunity through visible recognition.

The results of the research were drawn from a sample of 609 high-technology SMEs generating the majority of their revenues in foreign markets on two or more continents. Many of them can be categorized "born global" firms or "international new ventures" (INVs). Since the mere identification of internationalizing SMEs among a population of SMEs poses a challenge in itself (Rialp & Rialp, 2001; Baldegger et al. 2016), sample bias issues cannot be excluded, and thus the generalizability of the findings should be questioned. Moreover, this study was based on internationalizing SMEs from a SMOPEC in a middle European country. For them, the potential scope of foreign markets and their underlying economic development stands in strong contrast to internationalizing SMEs from an emerging economy such as China, India or Brazil, which might internationalize towards economically better-developed markets of the OECD countries. Economic development needs to be considered in this case, since emerging markets consist of less infrastructure, institutional voids (Mair & Marti, 2009), and thus a higher uncertainty, just to name a few issues.

This contribution follows a path of looking to further integrate social network characteristics into the study of SME internationalization. Further studies addressing the notion of network hubs, also in the case of SME

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“If we help create a digital imprint in our enterprises, they will not only be more productive but will also be able to scale up and internationalize faster.”

Peter Ong
Chairman, Enterprise Singapore

While small- and medium-sized enterprises (SMEs) are increasingly required to look for growth beyond their national markets, the increasing digitalization of the global economy provides them with ample opportunities for internationalization. However, many SMEs are unable to internationalize digitally because they were not initially designed to scale that way, and managing business model scaling in the online environment is challenging. In response to this, the current study applies a quantitative descriptive analysis of survey data on business adoption of digital technologies by 535 Canadian online-based SMEs. The aim is to understand, 1) how internationally-oriented online SMEs differ in terms of their digitalization from those focused on domestic markets, and 2) how these differences are related to the companies' business model for scaling internationally. The results show that internationally-oriented online SMEs differ from their domestically-oriented peers, in terms of a higher degree in the 1) use of information systems, 2) extent of value networks, 3) emphasis on key internal resources, and, 4) dealing with cybersecurity issues. The study contributes to the literature by suggesting that online SMEs willing to scale internationally through digitalization need to develop a set of capabilities in regard to partnering, customer relationship, and business process management, as well as investing in information and communication (ICT) resources and cyber resilience.

Introduction

Due to today's increasingly competitive global market environment, business model scalability and internationalization have become a necessity for small and medium sized enterprises (SMEs) (Durmaz & Ilhan, 2015). “Scalability” refers to a SME's ability to grow quickly without being hindered by constraints imposed upon its business model structure (Lund & Nielsen, 2018; Monteiro, 2019). In particular, SMEs seeking growth need to consider early and rapid internationalization as many national markets are not only highly competitive, but also too small, mature, and isolated for lucrative growth (Freeman et al., 2005; Taylor & Jack, 2011). Although Abdi and Aulakh (2018) submit that SMEs can derive scaling benefits from expansion both within their national market and across national boundaries, the latter is likely to provide them with more benefits. By expanding across borders, they can gain access to new markets, achieve economies of scale and scope, engage in beneficial learning opportunities, and

utilize low-cost factor inputs (Kim & Aguilera, 2015), all relevant aspects in business model scaling. Further, Abdi and Aulakh (2018) note that internationalization augments a SME's scale of operations, which is a key determinant of performance.

At the same time, the increasing digitalization of the global economy provides SMEs with opportunities for internationalization and scaling (Stallkamp & Schotter, 2019; North et al., 2020). “Digitalization” means using digital technologies to change a company's business model in a way that provides new revenue and value-creation options, while digital business models also allow for scalability and rapid cross-border expansion (Zhang et al., 2015; Holand et al., 2019). For example, digital multisided platforms (MSPs) can generate value by facilitating transactions between buyers and sellers in multinational or global markets (Bharadwaj et al., 2013; Stallkamp & Schotter, 2019). In fact, due to the fact that more and more digital innovations are globally available from inception via digital MSPs, their average time to

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international penetration has reduced from multiple years to a few weeks (Shaheer & Li, 2020). However, Jablonski (2016) notes that scalability has other drivers beyond mere digitalization, including a company's ability to internationalize their business model. Although digitalization has created new possibilities for SMEs to scale up and internationalize, our current understanding of business model scalability is still under-developed (Zhang et al., 2015).

While digitalization and internationalization are connected with business model scalability (Bruhn, 2017; Stallkamp & Schotter, 2019; Cassetta et al., 2020), many SMEs are unable to internationalize digitally because they were not designed to scale that way in the early stages of their existence (Bailetti & Tanev, 2020). This may be partly due to the fact that literature on internationalization capabilities has focused on large multinationals, rather than on SMEs (de Perea et al., 2019). Thus, this special edition responds timely to the call for more internationalization research on SMEs. Further, despite online-based businesses arguably having advantages over traditional ones in terms of advancing digitalization and establishing a global presence, many scholars (for example, Knight & Liesch, 2016; Joensuu-Salo et al., 2018; Wittkop et al., 2018; Jean & Kim, 2020) have underlined that academic research on online-based SMEs using digitalization for internationalization remains sparse. As a result, little is still known about the mechanisms by which such SMEs accomplish business model scaling through digitalization (Huang et al., 2017; Lee & Falahat, 2019). In addition, a major gap in our current understanding about scaling lies in how digitalization affects a SME's international growth (SERS, 2019), and whether the business models of domestic SMEs differ from those that have internationalized (Child et al., 2017).

This study aims to examine, 1) how internationally-oriented online SMEs differ in terms of their digitalization from those focused on domestic markets, and, 2) how these differences are related to those SMEs' business model scaling. In so doing, the study applies quantitative descriptive methods based on a survey data set of 535 Canadian SMEs that conduct business online, either with a national or international focus. The examined online-based SMEs constitute a subset of respondents taken from a larger survey data set focused on corporate adoption of digital technologies in Canada, which is publicly available under the "Open Government Licence —Canada". Given the large number of variables in the survey, as well as the explorative nature of this

research, the paper only focuses on those factors involved with digitalization that distinguish domestic and international online SMEs from each other. The study then elaborates on the identified differences in light of previous research on small firms' internationalization through digitalization, as well as about scaling business models. Finally, the study concludes by discussing contributions to theory and practice, as well as providing limitations and future research avenues.

Method

Data collection

This study relies on an exploration of publicly available data from the Canadian "Survey on Business Adoption of Digital Technologies 2017". The data set is licenced under "Open Government Licence —Canada", by Innovation, Science, and Economic Development Canada, a department of the Federal Government that nurtures a growing, competitive, and knowledge-based Canadian economy. According to the Government of Canada's (2018) website, the full data set contains anonymous responses from 2,401 Canadian companies to a survey measuring "the adoption and use of various digital technologies by Canadian businesses, such as use of the internet, use of information and communications technologies (ICTs), use of government services online, various barriers and impacts, as well as ICT training and security practices". As the focus of the present study was to understand internationalization through digitalization, any variables measuring companies' use of Canadian public online services (for example, tax filing), as well as questions about internet service providers, and type of Internet connection the companies use, were omitted.

The main variables that were included in the analysis are as follows:

Online Presence

- Website existence and features: ordering and booking, payment
- Social media integration, mobile version, third party marketplace services, online purchase

ICT Resources

- Cloud services, data analytics, mobile connectivity
- Software: CRM, ERP, accounting, office, design, custom, payment, web applications, client-server
- ICT expenditure, specialists, personnel and training

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Benefits of ICT

- Reduced: costs of operations, response time, transaction times, and reliance of physical documents
- Improved: productivity, competitiveness, product or service quality, information sharing, multi-skilling, partnerships, training, remote working, ease of access, marketing

Barriers to ICT adoption

- Unawareness of technology, lack of skills, questionable ROI, incompatibility, implementation cost, maintenance cost, user resistance
- Security concerns, lack of time, lack of use among partners, access, integration, updates, reliability

Cybersecurity practices

- Email encryption, security patches, authentication solutions,
- Security measures, cyber insurance, mitigation measures

Cybersecurity breaches

- Theft or unauthorized access to information, ransomware,
- Reputational damage, service downtime, losses (income, productivity, stress/fear)

For the purposes of this study, we focused on a subset of respondents using the following selection criteria: the chosen companies 1) are SMEs (that is, < 250 employees according to OECD standards, 2020), 2) engages in sales of goods or services via the Internet, and 3) reports if the majority of their Internet sales are domestic or international. In accordance with the notion of Vadana et al. (forthcoming), we considered online sales, that is, the sales of goods or services via the internet, as a reflection of a company's digitalization. Further, in regard to online sales, we focused on the proportion of "international sales" (compared with domestic sales) rather than international "presence" or international "footprint". This is because Hennart (2019) and Shaheer and Li (2020) suggest that the international "penetration" (measured by international sales) is a more relevant and accurate measure than "presence" (measured by international availability), from the perspective of understanding digital internationalization. Further, Vadana et al. (forthcoming) understand the degree of digital internationalization by companies' use of digitalization to scale and "achieve a higher share of foreign sales with limited foreign assets". The final data set included 535 Canadian SMEs that conduct at least part of their business online. Only 5.5 percent indicated that all of

their sales are online, while the vast majority (79.4%) reported that less than half of their sales are online. Further, of the 535 companies, only 11 percent reported that the majority of their online sales are international, while 89 percent indicated that most of their online sales are domestic. In the remainder of the study, we refer to them as "international" and "domestic" SMEs. This categorization is in line with Stallkamp and Schotter (2019), who discussed digital platform business internationalization in terms of "cross-country" and "within-country" models, as well as with Kim and Aguilera (2015), who distinguished between "inter-regional" (foreign) and "intra-regional" (home) market emphasis. Similarly, Abdi and Aulakh (2018), discussed the degree of internationalization through the portion of sales from "cross-border" markets versus "domestic markets", and Loncan and Nique (2010) discussed SMEs' degree of internationalization in terms of their revenues from "international" markets vis-à-vis "domestic" markets. Of note, "international SMEs" in the present study do not reflect whether the companies have physical offices in foreign countries.

The top 4 industries among the companies were "retail trade" (18.1%), "professional, scientific and technical services" (14.8%), "arts, entertainment and recreation" (10.7%), and "wholesale trade" (10.1%). A total of 39.1 percent of SMEs had fewer than 10 employees, 69.3 percent had fewer than 60 employees, and 26.5 percent had over 100, but fewer than 250 employees. The mean number of employees in the data set was 48.4 (SD=58.8) for domestic and 69.9 (SD=67.8) for international SMEs, suggesting that company size in terms of employees can be a proxy for growth. However, in the absence of additional data, the study omits such an assumption, and does not further discuss business growth in terms of the number of employees.

Data analysis

Given that the survey was not designed by the researcher of the present study, it was deemed most appropriate to analyze the data using quantitative descriptive methods. Typically, descriptive research is preplanned and structured by design to provide statistically inferable data. Thus, the information collected is based on providing respondents with predefined categories they must choose from. In the survey here, such categories predominantly focused on whether or not the company used something, or if the respondent agreed or not upon a particular question. Consequently, we applied a cross-tabulation technique to detect any potential differences between expected and realized counts of included categorical variables between two investigated groups:

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domestic and international SMEs. Cross-tabulation was suitable for analyzing categorical data from large samples, and thus we used Pearson's Chi-Square tests (χ^2) to evaluate the likelihood that any difference between the two groups may arise by chance.

A statistically significant test value indicates that the domestic and international SMEs clearly differ in terms of a given variable. In a 2*2 contingency table, expected frequencies should be at least five for each of the cells; otherwise, Fisher's exact test needs to be used to determine if there are non-random associations between the two categorical variables (Field, 2013). In this study, the majority of identified differences complied with the requirement, and only one variable needed to be tested using Fisher's exact test. Further, this study reports the "relative risk", which is a ratio of event probabilities. The data were analyzed using IBM SPSS version 26, and, due to the large number of variables in the survey data and the descriptive nature of the present study, the following sections focus on reporting and discussing only the variables that were found to have statistically significant differences between the two groups, thus suggesting that internationalization of SMEs is connected with digitalization.

Results

As a result of the descriptive analysis, a total of 7 variables were found to incur statistically significant differences between internationally focused and domestically focused online SMEs. These seven variables were categorized under four distinct areas relevant to digitalization. Table 1 shows the four areas as well as the specific variables within those areas, together with proportions of occurrence in international and domestic company groups, as well as relevant test statistics. Also, the table shows "relative risk" (RR), which refers to the probability of occurrence in international vis-à-vis domestic groups. In particular, RR values of more than 1 mean that the specific variable is more likely to be found in international SMEs than domestic ones. The results are then further elaborated and discussed in light of previous research on digitalization, internationalization, and business model scaling.

Use of information systems

In regard to information systems, internationally-oriented online SMEs seem to differ from domestically-oriented ones in two ways. First, international SMEs are 1.35 times (35%) more likely to use Customer Relationship Management (CRM) software than

domestic SMEs. Whereas as many as 62.7% of international SMEs used CRM software for customer or supplier relationship management, only 46.4% of domestic SMEs reported they are using it. Second, internationally oriented SMEs are 1.87 times (87%) more likely to use Enterprise Resource Planning (ERP) software than domestic SMEs. In general, ERP seems to be not as widely applied as CRM; only 47.5% of international SMEs, and a mere 25.4% of domestic SMEs reported they are doing so. The focus on CRM rather than ERP may be explained by the fact that growth-oriented SMEs start by improving customer relationships in their existing markets, and only then move on to improving their offering and channels, typically as they pursue internationalization (Heikkilä et al., 2018). Nonetheless, there are several factors that may explain why CRM and ERP software are more used by internationalized SMEs.

According to de Perea et al. (2019), customer relationships are crucial for the internationalization of SMEs. Durmaz and Ilhan (2015) argue that efficient CRM contributes to business growth, and Zhang et al. (2015) add that scaling requires deep engagement and communications with customers. Specifically, scaling companies need to track and align their value propositions to customers, and communicate both internally and externally in order to deliver high value to customers before, during, and after they use products or consume services (Bailetti & Tanev, 2020). Monteiro (2019) argues that growth firms emphasize personalized contacts with customers and aim at improving customer satisfaction, rather than reducing costs. Hence, marketing capabilities in terms of customer identification, evaluation, and retention (Neubert, 2018), as well as marketing communications (Joensuu-Salo et al., 2018; Falahat et al., 2020) are important. Software systems such as CRM and ERP enable better connectivity with customers and suppliers (Cassetta et al., 2020), and enable tracking and management of both customer relationships and business processes. The ability to integrate those systems reflect a firm's digitalization excellence (Frick et al., 2020), which is a key issue for rapidly internationalizing companies (Neubert, 2018).

Extent of value networks

Similarly, regarding the use of information systems, the results show that international online SMEs are different from domestic online SMEs in two ways with respect to the effects of digitalization on their value networks. First, international SMEs are 1.35 times (35%) more likely to have increased partnerships or system integration with

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Table 1. Statistically significant differences between international and domestic SMEs

Digitalization area	Int. %	Dom. %	χ^2	df	Sig.	RR
<i>Information systems</i>						
... use of CRM software	62.7%	46.4%	5.574	1	< 0.05	1.35
... use of ERP software	47.5%	25.4%	12.687	1	< 0.001	1.87
<i>Value networks</i>						
... have more partners through ICT	66.7%	49.3%	5.784	1	< 0.05	1.35
... use third party online services	39.0%	23.3%	7.973	2	< 0.05	1.67
<i>Internal resources</i>						
... have internal technology specialists	52.5%	37.2%	5.210	1	< 0.05	1.41
<i>Cybersecurity issues</i>						
... regularly patch OS and applications	71.2%	55.3%	5.438	1	< 0.05	1.29
... service downtime due to data security breach	100.0%	57.1%	Fisher's test		< 0.05	1.75

other companies through the introduction of ICT than domestic SMEs. Approximately two-thirds (66.7%) of international companies indicated having more partnerships and system integration due to digitalization compared to half of companies (49.3%) among domestic firms. Second, international SMEs are 1.67 times (67.0%) more likely to use online services provided by third party e-marketplace suppliers such as Amazon and Shopify, than domestic SMEs. Whereas 39.0% of international SMEs reported their online presence through applying third-party online services, this figure was only 23.3% in the group of domestic SMEs. Nonetheless, the impacts of digitalization and internationalization on SMEs' value networks were not unexpected, because, for example, Verhoef and Bijmolt (2019) strongly associate a firm's networking capability with both digitalization and globalization of a business.

Also, according to a number of previous studies (Kim & Aguilera, 2015; Zhang et al., 2015; Jablonski, 2016), business model scalability depends on the ability of a company to establish partnerships both nationally and internationally. However, cooperating with global partners tends to provide more value from the perspective of a SME's internationalization (Jin & Hurd, 2018; Glodowska et al., 2019). Clarysse et al. (2011) argue that such partners provide a SME with efficient

knowledge acquisition and learning, as well as important resources. Further, Lund and Nielsen (2018) submit that scalability may require finding new distribution channel partners, and outsourcing non-core technology development or service provision to third parties. Digital technologies enable integration and connectivity with third-party services that are provided by global value network partners through application programming interfaces (APIs) (Bharadwaj et al., 2013; Cassetta et al., 2020; Fischer et al., forthcoming). Further, Verhoef et al. (forthcoming) suggest that a SME's "digital networking capability" becomes of ultimate importance for its growth; in other words, SMEs need to co-create value with various digitally connected partners.

Emphasis on key internal resources

The third area of differences between international and domestic SMEs comprises internal resources in terms of employed technical staff. The results show that international SMEs are 1.41 times (41%) more likely to have internally employed technology specialists compared with domestic SMEs. In particular, a total 52.5% of international SMEs reported they are using internally employed technology specialists, whereas a mere 37.2% of domestic SMEs were doing so. Again, the results are not fully unexpected, as Beliaeva et al. (2020) as well as Ritter and Pedersen (forthcoming) argue that a

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firm's digitalization capability is related to the type and expertise of its staff. Martinez-Caro et al. (2020) add that digital technologies can generate tremendous value provided that they are used and well-managed. Bailetti and Craigen (2020) put forward a number of scaling assertions, including the use of trusted cross-border digital platforms that enable payments, data analytics, and localization. Nonetheless, scaling companies should employ internal teams of experts that have data access, data generation, data management, data visualization, and both analytical and business skills (Ritter & Pedersen, forthcoming; Verhoef et al., forthcoming).

The importance of internal technological resources is also addressed in previous literature on business models and internationalization. For example, Clarysse et al. (2016) argue that technological resources are an important resource bundle, and To et al. (2019) add that the mastery of technology and business complexity are the most necessary antecedents of business model innovation. Monteiro (2019) argues that the management of a firm needs to restructure the business model especially in terms of skilled labor resources in order to scale. One of the key decisions for management to make is which resources to commit to internationalization (de Perea et al., 2019). According to Jean and Kim (2020) and Cassetta et al. (2020), information technology resources have a significant effect on a SME's internationalization. Although the use of digital platforms and third-party services ease international entry barriers by helping SMEs overcome resource constraints, there is also need for elementary internal staff recruitments (Jin & Hurd, 2018). Indeed, Rachinger et al. (2019) found that employee's competences are among the most significant future challenges for SMEs considering digitalized business model innovation.

Dealing with cybersecurity issues

Finally, there seems to be differences between international and domestic SMEs in terms of cybersecurity issues, including ways to mitigate cybersecurity threats. That said, it should be noted that significantly fewer companies responded to questions about cybersecurity vis-à-vis other sections in the survey. Hence, Pearson's Chi-Square could not be used for analyzing cybersecurity issues, but Fisher's exact test suggested that there are statistically significant differences between the two groups of SMEs. First, the analysis shows that international SMEs are 1.75 times (75%) more likely to suffer from service downtime as a result of data security breaches compared with domestic SMEs. To be exact, all (100%) of the international SMEs that responded to the question reported that they had

suffered from service downtime. Conversely, this figure was only a little bit more than half (57.1%) for domestic SMEs. Second, international SMEs are 1.29 times (29%) more likely to regularly patch their operating systems and applications than domestic SMEs. As many as 71.2% of international SMEs indicated they are regularly patching their systems, whereas only 55.3% of domestic SMEs were doing so.

These results are interesting in several ways. Scaling not only requires delivering new benefits to customers and committing to rapid growth, but also keeping the company and its stakeholders secure from cyberattacks (Bailetti & Craigen, 2020). Indeed, Guitton (2019) and Senyo et al. (2019) argue that cybersecurity is a business issue, as more and more sensitive corporate and customer data is collected and stored in digital formats. Hence, it is not a surprise that North et al. (2020) found most SMEs are worried about cybersecurity, as they are implementing increasingly complex and potentially more vulnerable digitalized processes. Further, Neubert (2018) found that global startups are particularly highly concerned about data protection. Jang-Jaccard and Nepal (2014) argue that data breaches are likely to occur when companies do not use an encryption scheme or apply recommended patches on time, or if they simply forget to apply security filters and policies. Given what was found above that international SMEs are more likely to use CRM and ERP systems, the increase in software-level attacks certainly calls for installing security patches and keeping the systems up-to-date (Jang-Jaccard & Nepal, 2014).

Discussion

The objective of this study was twofold. First, it aimed to examine how internationally oriented online SMEs differ in terms of digitalization from those focused on domestic markets. Second, it aimed to explore how these differences are related to their business model scaling. International online SMEs were defined as small- and medium sized businesses with over half of their online sales coming from international markets, in comparison with domestic SMEs whose online sales mainly come from domestic markets. A descriptive statistical analysis of publicly available survey data from 535 Canadian online SMEs' adoption of digital technologies revealed that the two groups differ from each other in terms the degree of of 1) use of information systems, 2) extent of value networks, 3) emphasis on key internal resources, and 4) dealing with cybersecurity issues. International SMEs are more likely to use CRM and ERP systems to manage their customer and supplier relationships, as well as business processes than domestic SMEs. Further,

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international SMEs tend to have more partners and inter-organizational system integration, as well as use third-party services provided by e-marketplaces. In addition, international SMEs tend to invest in key resources in terms of internally employed ICT specialists. Finally, international SMEs are more likely to suffer from downtime due to data security breaches, and thus to put more effort into patching their systems and applications.

The results have some relevant implications for theory. First, the study contributes to the literature on internationalization of SMEs by confirming findings from prior studies on the positive role of ICT resources and value networks for internationalization, as well as adding to the discussion on the capabilities associated with digitally enabled growth of SMEs (North et al., 2020; Vadana et al., forthcoming). The results contribute to literature by suggesting that international online SMEs differ from domestic ones by having higher networking capabilities, digitalization capabilities, and scaling capabilities. Scholars such as Freeman et al. (2005) and Jin and Hurd (2018) have associated rapid internationalization with extensive social networks, business partnerships with large foreign firms, attention paid to client followership, advanced use of ICT, and multiple modes of entry. This study specifies that internationalization of online SMEs is associated with being able to create new partnerships and foster inter-organizational system and service integration, particularly with large international online marketplaces and platforms. Further, the use of critical information systems such as CRM and ERP software for managing customer relationships and business processes in the digital and international environment is essential.

Second, in line with the above arguments, the results contribute to the literatures on scaling and business model innovation (for example, Wittkop et al., 2018) by suggesting that cybersecurity is a key element in business model scaling. Three out of the identified four areas important to scaling through digital internationalization, namely managing customer and supplier relations, internal resources, as well as networks and partnerships, are commonly accepted business model components (Child et al., 2017; Wittkop et al., 2018; Gupta & Bose, forthcoming). Interestingly, cybersecurity is an element not commonly mentioned in the business model innovation and scaling literature (cf. Jablonski, 2016). However, the scaling of a business digitally builds on achieving economies of scale through the sharing of a company's extended cyber-infrastructure in a global environment (Hsu, 2007). This

exposure obviously comes with an increase in cyber threats and thus calls for more action to protect the aspiring growth business from cyberattacks. However, in line with Bailetti and Craigen (2020) who argue that cybersecurity is not only about protection but also about innovation, the present study argues that cybersecurity is both a necessity and an enabler of scaling through digital internationalization.

Regarding implications for practice, our results suggest that SMEs seeking growth through digital internationalization need to develop a set of capabilities, specifically in regard to partnering, customer relationship, and business process management, as well as invest in ICT resources and cyber resilience. Raban et al. (2018) define cyber resilience as “the ability to absorb attacks, as well as to recover from them and rapidly restore business operations back to normalcy”. The importance of taking cybersecurity seriously when pursuing digital internationalization cannot be overemphasized, as the internet—regardless of its huge potential and many benefits—tends to be a hostile environment, and, as awareness about an online business in the web increases, the number of attempted cyberattacks to it will likely increase. Given that it is difficult to fully protect a business from a multitude of hostile cyberattacks, the best managers and entrepreneurs of online SMEs can do is to keep their systems and applications up-to-date and install any security patches that are available. In the words of Albert Einstein, “the world is not dangerous because of those who do harm but because of those who look at it without doing anything.”

Finally, similar to any scholarly research, the present study has some limitations. First, the study was based on an analysis of publicly available survey data published under the “Open Government Licence — Canada”. Although the data were rich and included a vast number of variables, the questionnaire was not designed for the purposes of the present study, and the available data lacks essential background information (for example, respondent's status in the organization, the company's age, business performance indicators such as profitability and growth of revenue, etc.) that might better explain the results. Second, the lack of performance indicators also limited the type and extent of methods used for analysing the data. This study made use of descriptive statistical analysis, which can be used to identify differences between various groups of companies, but cannot confirm any direct causalities. Further, while rapid scaling through internationalization can improve a company's performance, it also increases

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the risk of failure (Glodowska et al., 2019). Again, this fact could not be addressed in the descriptive analysis of the present study. Hence, future research should investigate causal relationships between the identified differences in international and domestic online SMEs and their business performance.

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How Institutions Promote Digital Marketing in Small and Medium International Companies: Comparison between Costa Rica and France

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“Marketers need to build digital relationships and reputation before closing a sale.”

Chris Brogan
Chief Executive Officer of Owner Media Group

The objective of this paper is to analyze institutional promotions to small and medium international enterprises on the subject of digital marketing. The authors conduct qualitative research with a descriptive scope, including 12 institutions in Costa Rica and France. The study is dedicated to working with SMEs involved in an internationalization process and offering them some type of training. For the collection of information, an in-depth interview with each participant was applied. It concludes that SMEs promote digital marketing through institutions, and that the way in which they carry it out varies between the two countries, Costa Rica being a more general and structured service, and France a more customized one.

Introduction

More and more companies want to embrace the digital world in order to gain visibility in their existing market, as well as enter into new ones. Nowadays, even companies that are still small already have an internet presence, some starting from an early stage.

Pérez-Fabara and Charro (2017) state that: “The use and availability of technological resources has emerged as a cultural complement for men. It has allowed the latest evolutions in the electronic field leading to an easy accessibility to digital consumers. As a consequence, the human being has been transformed into an element of change that faces the current paradigms within the environments in which he evolves”.

Thus, consumer behavior is very different from what it was not so many years ago, partly because we have entered a digital age in which companies must adapt in order to remain competitive. Part of this adaptations is the emergence of digital marketing, which has become an essential tool to promote products and services, and also to relate to a company's current and potential customers (Cangas Muxica & Guzmán Pinto, 2010; Alford & Page, 2015).

Digital marketing also appears as an interesting lever in the current context of globalization. Indeed, international activities have been identified as one of the most important levers for economic growth (Bokunow 2019). While traditionally, international competition has been restricted to large companies, the context has radically changed, and small and medium-sized enterprises (SMEs) are now pushed to internationalize in order to survive (Lemaire, 2013). To help with this, digital marketing can become a useful tool for small businesses that want to expand their horizons into new international markets (Morgan et al., 2012). However, despite being an accessible option for this type of business, the best way to use it is open to consideration (Lee & Falahat, 2019). Reibstein et al. (2009) advise that companies should not just opt for those methods that are considered most advanced, but rather use concepts and methods that are most appropriate to generate internal value for the company.

Knowing the best way to use the available tools usually means having to rely on a third-party body to give training on the topic (provided by public or private suppliers). Unfortunately, many companies might consider that they don't get much benefit from training in comparison to the costs incurred in the process (Padachi & Lukea Bhiwajee 2016). Indeed, SMEs are generally engaged in short-term operations, based on

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solving day-to-day problems (Maes et al., 2019). Limited resources force them to make trade-offs in which digital marketing may not appear as a priority, despite the company's ambition to develop new markets (Louw & Nieuwenhuizen, 2019).

In this context, so-called "support institutions" play a relevant role both in raising companies' awareness about digital marketing, and for proposing dedicated training options for SMEs, ones that take into account the obstacles they face in order to start a learning process that can be implemented in their organization (Taiminen & Karjaluo, 2015). This research therefore aims to analyze the way support institutions promote digital marketing in international SMEs, both in Costa Rica and in their counterpart institutions in France.

Literature Review

It is already established that marketing becomes a major success factor, helping companies to identify and meet specific customer needs. Various trends have emerged regarding this topic, one of the most relevant currently being so-called "digital marketing".

What is digital marketing?

Aini and Hapsari (2009) define "digital marketing" as "market activities, including branding using a variety of web-based media such as blogs, website, E-mail, AdWorks, or social networking".

There are different tools in digital marketing (Lal, 2018), including:

- Search Engine Optimization (SEO): to ensure the visibility of a website in the unpaid results of search engines. The goal of SEO is to position the company's website on the first search page.
- Content Marketing: focus on creating and distributing valuable, relevant, and consistent content to attract and retain a clearly defined audience, and ultimately drive profitable customer actions. The uniqueness of this tool is to deliver high-quality content related to the company's products or services that will lead its audience to start the action of purchase.
- Social Media Marketing (SMM): the use of social media platforms and websites to promote goods or services. The specificity of these platforms is that they enable a two-way response, which involves feedback from the receiver to the sender.
- Email marketing: Clarification of the message and content that resonates with the purpose of a dedicated emailing campaign.

Use of these tools provides companies with a set of capabilities that could be exploited for their growth strategy. Bianchi and Mathews (2016) highlight several key capabilities that digital marketing enables, such as online promotion, online sales, post-sale online service, market research, and purchase contracting. Moreover, digital marketing provides a way to reach potential customers around the world, enabling cheap promotion of a company in international markets (Lituchy & Rail, 2000), and, at the same time, as a way to strengthen existing relationships due to the ease of communication with customers, suppliers, or partners.

This type of marketing provides a variety of benefits for companies. Verchaval (2016) highlights that the main advantages rely on its attractiveness of cost, which is affordable for many. Digital marketing is more accessible than other traditional marketing methods, such as television, radio, or printing. In addition, it increases the ability to control, optimize, and correct campaigns by providing great flexibility and dynamism, enabling customized and precise segmentation (Verchaval, 2016). Moreover, Clarke (2008) expresses that, "even when the goods need to be delivered physically, enterprises could use the Internet to sell their products directly to the customer, to discover potential customers, to bid online for procurement contracts or to be part of business-to-business (B2B) Internet exchange".

SMEs and Digital Marketing

In this research work, SMEs are defined as companies with a number of workers between one and 100. Micro-enterprises count as five or fewer employees, small companies as between six and 30 employees, and medium-sized companies as between 31 and 100 employees. Any company with a number of employees greater than 100 is classified as a large enterprise (MEIC, 2019).

Méndez (2003) states that SMEs "have been listed in the developing world as very important organizations for the economy in general and for society in particular because of their potential to generate employment, for their ability to produce income in weak sectors, for expanding the base of the private sector, for contributing to reducing the concentration of economic power, and for their contribution to the national product". After conducting a study of the use of digital marketing channels within SMEs, Taiminen and Karjaluo (2015) determined that the most widely used digital marketing tool is Search Engine Optimization (SEO), followed by email and social network campaigns in second and third

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place respectively. However, they also perceived that companies of this size have not extensively adopted digital tools within their marketing processes, and that the use of more advanced digital channels, such as companies' online promotion and blog generation, remains at a low level.

Various training methods enable SMEs to acquire the necessary knowledge and competencies to ensure better use of digital marketing. Parra-Penagos and Rodríguez-Fonseca (2016) identified coaching, staff development, and staff training as the three most common methods that contribute to enhancing knowledge among a company and its staff. First, the authors define "coaching" as a process in which companies enhance the knowledge and skills of employees in an accelerated, conversational, and more often unstructured manner (Parra-Penagos & Rodríguez-Fonseca; 2016). Next, "staff development" refers to an educational resource received by an individual, with the purpose of improving their professional and intellectual skills and, as a result, improving their professional effectiveness. Finally, "training" is when a company transfers knowledge to their employees who acquire skills in order to develop in their position, most often in a formal and structured way.

Parra-Penagos & Rodríguez-Fonseca (2016) emphasize that the need for training is born from changes in a company's external environment, which leads to the quick adaptation of workers to these new trends. Thus, any training method will be considered as part of the above described categories. Each of these methods have different characteristics, so it is recommended to choose the one that best suits a company's needs.

International SMEs and Digital Marketing

Internationalization involves SMEs extending their activities beyond national borders. It offers a number of advantages, while also involving certain challenges (Bhatia & Thakur, 2018). The globalization of markets leads to more varied offerings, a shorter product life cycle, and increasing customer demand. Due to their small size and limited resources, SMEs must make efforts to deal with this unstable new environment. Thus, the success of a company's international expansion depends mainly on the specific attitudes, resources, and capabilities it mobilizes to achieve its business objectives (Barbosa & Ayala 2017). Buckley and Casson (1976) began theorizing the concept of "internationalization". They suggested that any imperfection in the market in which a domestic

company finds itself could trigger the need for internationalization. The company develops internal activities that create specific advantages, both in the knowledge it uses and goods it produces. Internationalization then acts as a governance mechanism to develop and exploit these specific advantages abroad. Internationalization is thus a strategic tool developed by a company to be able to anticipate or exclude competitors (Buckley & Casson, 2019).

According to the OECD (2018), understanding international business opportunities, obtaining information on the location of relevant international markets, or characterizing international market entry opportunities are the biggest challenges that SMEs face when expanding internationally. The choice of entry mode is highly important as it deeply influences the overall strategy of these small organizations (Cui et al., 2011). This problem can also be accentuated by difficulties in international representation (Crick, 2007).

Thus, a study by Qurratu'Aini and Hapsari (2019), showed that digital marketing has a positive and significant impact on SMEs, thereby improving the chance to identify greater opportunities to participate in the exporting world through the use of digital marketing tools and strategies. A relevant digital marketing strategy can thus be seen as a lever to overcome some of the difficulties internationally-oriented SMEs encounter by providing them access to a broad range of valuable information on the foreign markets they are targeting.

Methodology

Research Design

Based on theoretical statements in the previous section, the research questions this work aims to address are as follows: *What is the role of support institutions in promoting and raising awareness of digital marketing for international SMEs? And what are the actions and operational means implemented to promote the use of digital marketing within these structures?*

To address this question, we formulate a hypothesis according to which institutional promotion can vary according to the context in which a company develops. As mentioned by Parra-Penagos and Rodríguez-Fonseca (2016), the need for training within companies is induced by a change in their environment. This

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means that, if we consider digital marketing support from a contingency perspective (Mintzberg, 1979), the institutions concerned have to adapt the support they provide to the specific context in which companies grow and develop. Based on these statements, we formulate the following research hypothesis:

H1- The role of support institutions regarding digital marketing promotion as well as actions implemented can vary according to the context in which they operate. This research was carried out using a qualitative approach. It seeks to describe an unknown phenomenon by collecting data without numerical measurement, but rather with descriptions and observations (Hernández Sampieri et al., 2010). The unknown phenomenon is the promotion of digital marketing in small and medium-sized international enterprises both in Costa Rica and France, by institutions dedicated to supporting these companies.

The scope of this investigation is descriptive and explorative, and consists of characterizing a specific situation, indicating its most peculiar and differentiating features. As Morales (2012) explains that the objective of these explorative investigations is to identify relevant situations and attitudes by describing the activities, objects, processes, and people involved. In this specific case, the purpose is to extract data from a properly defined sample (Morales, 2012), in order to specify information on the reality of the support given

by institutions in two different geographical contexts: Costa Rica and France.

Methodological approach

This descriptive research work relies on a three-step methodology: sample definition, data collection, and data analysis.

The first step was building a sample of institutions from Costa Rica and France that are dedicated to developing training activities for the growth of SMEs.

Nine Costa Rican and three French institutions were included in the sample. For reasons of confidentiality, we do not provide the names of the institutions; instead, we identified each institution with a number and classified it according to type:

- University institutions: universities that have SME development programs
- Promoter institutions: organizations dedicated to promoting interests that respond to the needs of the economy (public or private ones).
- Public institutions: organizations belonging to the state apparatus and that carry out training with SMEs

The second step concerns the data collection process. An in-depth interview was conducted within each of the institutions, which consisted of a meeting oriented towards understanding the perspectives of informants

Table 1. Institutions sampled (source: own development)

COUNTRY	CLASSIFICATION	INSTITUTION N°.
COSTA RICA	University institutions	Institution 1
		Institution 2
	Promoter institutions	Institution 3
		Institution 4
		Institution 5
	Public institutions	Institution 6
		Institution 7
		Institution 8
		Institution 9
FRANCE	University institutions	Institution 10
	Promoter institutions	Institution 11
	Public institutions	Institution 12

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regarding their experiences or situations, and capturing them as expressed in their own words (Taylor & Bogdan 1987). In these cases, there was no structured exchange of alleged responses, but a script on general topics was prepared and addressed throughout the interview (Robles, 2011).

Five main aspects addressed:

- Training services given to SMEs: The objective was to know what specific actions are taken with SMEs to transmit information to them, how the institutions establish the topics taught to SMEs in the formation processes, and also the level of response that institutions perceived from the SMEs related to the training services they offer.
- The use of digital marketing: which digital tools institutions used to provide information to SMEs and to respond to their consultations. How successful these media tools are for effective communication with SMEs.
- Digital marketing inclusion as a topic addressed by formation services: Which actions provide information about digital marketing to SMEs? Will future projects involve this topic? Which capacities and digital tools are taught involving digital marketing? What is the participant's opinion about the relevance of digital marketing in SMEs' performance?
- The monitoring given to knowledge transmitted to SMEs during the training services offered by institutions.

The interviews were conducted in person or by video conference. The duration of each in-depth interview was approximately one hour. This made it possible to find out the support given to SMEs through various activities carried out with these types of companies (introduction, training, follow-up, etc.), and, in turn, to determine whether any of these activities were focused on promoting digital marketing among international SMEs.

Notably, the interviews carried out in Costa Rica were conducted in Spanish, while the interviews in France were done in English. However, for coherence and understanding, all results were translated into English.

Finally, once the interview process was completed, data analysis, was carried out with ATLAS.ti software. This software was chosen because it is a tool that makes it possible to perform a qualitative analysis of

predominantly large volumes of textual data (Justice, 2005).

To present the results obtained, comparative tables are displayed below, with aspect evaluations, and responses obtained in both countries included. Presenting the results in qualitative comparison tables allows two or more cases to be presented as a common project in order to analyze their similarities and differences (Goodrick, 2014). In addition, the responses provided by both countries are presented together and associated with a specific figure that can reflect the relevant responses obtained in each aspect (Sojo-Castro & Mora-Esquivel, 2017). These figures represent either the total number of participants who responded in the affirmative to the assessed aspect; or the percentage ratio of institutions that responded affirmatively to the assessed aspect; or the number of times this aspect was mentioned in the interview. A representative quotation from the answers given in both countries was also provided for each assessed aspect.

The results obtained from the institutions were analyzed, which enabled us to determine the current reality of the training given to SMEs by the institutions. Thus, we could finally establish whether or not these institutions promote the theme of digital marketing within international companies.

Results

This section shows the results obtained from each institution. In each table, a comparison between Costa Rica and France is made with respect to the aspect evaluated.

Table 2 presents a comparison between the types of training provided in Costa Rica and France. In the case of Costa Rican institutions, the most predominant action with SMEs is training. While in the institutions of France, in addition to training, technical advice is also given with experts, through coaching.

Table 3 goes deeper into detail and proposes a description of topics addressed in the French and Costa Rican training courses. In both countries, the institutions determine the issues to be dealt with for SMEs through demand analysis, that is, by studying the wishes and needs of companies. In Costa Rica, it was seen that some institutions also used expert criterion for the determining these issues. In the case of France, apart from the demand analysis, they also provided an analysis of trends.

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Table 2. Type of training actions within SMEs

Representative quote from Costa Rica	Ratio of affirmative answers (Costa Rica)	Aspect: types of training action	Ratio of affirmative answers (France)	Representative quote from France
"Group and individual training courses are given to companies".	9/9	Training	3/3	"Product of diagnosis, you can establish the necessary training courses for each company".
"Basically, for SMEs are smaller workshops, they are workshops more focused on a specific topic".	4/9	Workshops	1/3	"We organize monthly workshops for companies".
"Every year there are more talks, because they bring international exhibitors to meet with a group of business professionals, business owners".	2/9	Talks	2/3	"We have an awareness side, where our partners meet with companies and present topics of interest and services we offer; sometimes, we have invited experts who share their experiences and we raise awareness of the importance of these issues".
"We also have more technical training programs that are more project-driven".	4/9	Technical advice	3/3	"In order to help companies, to get a clear picture of the situation, a technical advisor is hired".

Concerning the SMEs' perception of these training courses (Table 4), significant differences can be highlighted. In Costa Rica the institutions perceived high interest from SMEs in their services, while the French institutions expressed that in order to start

activities with a company, they first need to make direct contact or introduce their services to SMEs.

This observation can also be related to the dissemination channels used by institutions in both

Table 3. Setting topics for training SMEs

Representative quote from Costa Rica	Ratio of affirmative answers (Costa Rica)	Aspect: ways to set training topics	Ratio of affirmative answers (France)	Representative quote from France
"A survey was designed, and the partners were circulated just for them to tell us what the relevant topics are in training topics, as well as training".	9/9	Demand Analysis	3/3	"It is mainly the result of a survey, focused on the interests of companies".
"There is also the truth expert criterion, which is of course very valuable, especially as to where it is going, what is needed".	6/9	Expert Criterion	1/3	"Our colleagues also determine issues that can be interesting for the business".
"With international trends, knowing what is being covered, how it is being marketed, etc.".	5/9	Trend Analysis	2/3	"We begin with a general approach to what topics are often covered".
"They are also tailored to the client".	1/9	Other	1/3	"It's a collective decision with the regional coordination of the Grand Est".

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Table 4. SME response to this training

Representative quote from Costa Rica	Percentage of interviews in Costa Rica	Aspect	Percentage of interviews in France	Representative quote from France
"From the smallest, to medium-sized companies have shown interest".	89%	Interest on the part of SMEs	33%	"It is more than a matter of trust, of establishing a human relationship between the company and the advisor, without that, many SMEs would not turn to us in the first place".

countries to provide information about them and their services to the companies (Table 5). Institutions in both countries have websites and they also resort to sending promotional emails to their current and potential partners. In the case of Costa Rican institutions, great use is made of social networks to provide information to companies. In this respect, the French institutions did

not indicate the use of these digital tools; on the other hand, they expressed that making direct contact with companies is what has given them the most results in establishing activities with SMEs.

Table 6 puts forward differences in the promotional approach of each type of institution. In Costa Rica, the

Table 5. Media used to provide information to SMEs

Representative quote from Costa Rica	Ratio of affirmative answers (Costa Rica)	Aspect: media used to provide information	Ratio of affirmative answers (France)	Representative quote from France
"Social networks, through Instagram and Facebook, that we have mainly been promoting their activities".	8/9	Social Media	1/3	"We have Facebook, Twitter, we have Linked-in, we have Instagram, but we don't make a count of posts".
"We call on our partners via email".	8/9	Email	3/3	"Once we start having a relationship with companies, we start communication by email, and in this way, we coordinate".
"We always use the medium of our website that has a whole section where we present our training services".	8/9	Website	3/3	"On our page, we have our services, an explanation about these, and our conditions to be eligible for benefitting from our services".
"There's a telemarketing department".	3/9	Phone	0/3	-
"Press releases are published".	3/9	Newspaper	2/3	"We have a monthly newspaper publication".
"We have realized that personal contact sometimes has more impact than the use of social media, or the website".	1/9	Direct Contact	3/3	"Personal contact between specialist advisors and their client portfolio".
"We provide information to SMEs or SMEs know about us through other institutions".	1/9	Other	0/3	-

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Table 6. Promotion by institutions on digital marketing issues

Representative quote and percentage of interviews from Costa Rica	Type of institution - Costa Rica	Aspect	Type of institution - France	Representative quote and percentage of interviews from France
"They have not been seen as needing to include some training in digital marketing topics". (0/2)	University	Promote Digital Marketing	University	"On digital marketing, we just did it in 2017; I think, that was the first time we did a digital marketing presentation". (1/1)
"The goal is to give companies the knowledge of how these tools are used and how advertising can be done that way". (3/3)	Promoter		Promoter	"Digital marketing is fully integrated into the training process we offer. One of our sectors of activity has an advisor specialized in the digital part of the promotion". (1/1)
"We do, because it is important at the moment for SMEs to know digital marketing, the management of social networks, how to offer their products, that is a fundamental truth at this moment, also that many people do not necessarily have to own a physical premise to do marketing for their products or business ideas". (3/4)	Publishes		Publishes	"Digital marketing is covered, not as an isolated topic, but as part of the whole process. So with SMEs who are interested in digitizing their promotion they can work with our experts on the subject". (1/1)
67%	Percentage of Institutions that Promote Digital Marketing			100%

promoter and public institutions promoted the theme of digital marketing in SMEs through their training services. It was discovered that the same promotions are not available from the university institutions that participated. In the case of the French institutions, this issue is promoted, but with no specific approach. Rather, digital marketing was seen as part of a larger development process included in other support initiatives.

With regard to the digital tools taught by the institutions (Table 7), a big difference was revealed between the two countries. In the case of Costa Rica, we ascertained that the digital tools on which they focus most for their training offers are the use of social networks (57 mentions), the design of a business website (40 mentions), and searcher positioning (26 mentions). In the French institutions, the list of digital tools taught to SMEs was defined according to the needs of each case,

that is, they offer a more personalized service (15 mentions). Despite not having a predetermined list of topics to be addressed, some that have been used in the past were mentioned, such as the Industry 4.0 app, Google and Amazon Cloud tools, and Artificial Intelligence applications in some respects.

Concerning the capabilities taught to SMEs (Table 8), the situation occurs similarly to digital tools. The Costa Rican institutions already established capabilities that they want SMEs to achieve with digital marketing. The most mentioned were the training of a marketing strategy that integrates digital tools to become more competitive, followed by managing their distribution channels, having the possibility to expand their market, and strengthening relationships with suppliers, customers, and/or partners. In the case of French institutions, they again stated that the definition of skills to train SMEs with which they work was defined

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Table 7. Digital marketing tools taught by institutions

Representative quote and number of mentions of Costa Rica	Tools taught in Costa Rica	Aspect	Tools taught in France	Representative quote and number of mentions from France
"Social networks started a long time ago, but they are under an approach that is also aligned with the strategic plan of the organization". (57)	Proper Use of Social Media	Digital Tools	Custom Tool Definition	"That aspect depends on the needs of each company that is helped. We customize the offer for each SME". (15)
"Includes the theme of search engines, like being top when they're looking for me". (26)	Searcher Positioning			
"If I have a website, like taking advantage of that website, from the subject of the blogs, that people can even depending on the nature of the business make a blog, then everything will depend on my profile as an entrepreneur". (40)	Website Design			
"How to Make Your Promotional Videos on YouTube". (1)	Other			

*For this table, only the responses of the institutions that indicated giving training in the area of digital marketing were considered.

Table 8. Digital marketing capabilities taught by institutions

Representative quote and total number of interviews in Costa Rica	Skills Taught in Costa Rica	Aspect	Skills Taught in France	Representative quote and total number of interviews in France
"They are told about the importance of having their digital marketing plan consistent with strategies, because if you're talking about something in your strategy goals, and you exploit it differently in marketing tools, let's say you have another speech, so always in the trainings not only in this one, we try to make them aware that it is what they have and where they go, what their product is, that they communicate their product, and that this communication goes on a single channel". (5)	Digital Marketing Strategy	Digital Marketing Capabilities	Definition of Skills According to Needs	"I must say that what we teach them to do depends on the situation of each case. That is why it is very important to analyze each situation carefully". (3/3)
"In how these tools give them the opportunity to compete with companies bigger than them. At other times small companies lose, now it is possible to get ahead". (4/6)	Increase Competitiveness			

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"At the product level, in the area of digital marketing, yes because they improve their processes and with these channels can improve the chain, so it does drag this type of capabilities". (3/6)	Manage Distribution Channels			
"If you are told that digital marketing has no limits, because anyone, someone who is in India can access your Facebook, and there may already be a connection, or someone in Korea, etc., so we talk to them that these skills open up the spectrum to them". (3/6)	Expand your Market			
"Those channels to one allows you a direct communication line, then if someone sees an Instagram photo of an orange, can write a message to it at once and say 'I'm interested,' and they already have fluid communication, that in earlier times was almost unimaginable. This is one of the possibilities that we tell participants, and for us it is also important to train them in other skills such as sales speech which is the company's discourse in front of their potential buyers, and that goes into digital marketing". (5/6)	Strengthen Relationships with Suppliers, Customers and/or Partners			

*For this table, only the responses of the institutions that indicated giving training on the topic of digital marketing were considered.

according to the needs of each case, with no pre-established list to be applied to all.

Finally, regarding the monitoring that institutions realize in order to analyze the knowledge they transmit to SMEs, there is also a significant difference between the two countries. In Costa Rica, a lack of follow-up to SMEs could be noticed once training services had been completed. Only the promoters indicate that they usually do follow-up on this topic. In France, the situation is different. The monitoring of companies' improvement is very intense throughout the training process provided by the institution. They offer

accompaniment to SMEs throughout the development process which they undergo.

Discussions and Conclusion

The objective of this research work was to analyze the promotion given by institutions on the topic of digital marketing in both France and Costa Rica, based on a qualitative analysis of 12 interviews.

It was highlighted that promoting this issue exists in both countries, however, some particularities related to the context in which institutions operate arise.

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Table 9. Monitoring by the institutions to the knowledge transmitted to SMEs

Representative quote and total number of interviews in Costa Rica	Institution class - Costa Rica	Aspect	Institution class - France	Representative quote and total number of interviews in France
"We take the course, that is it. More than that there is no direct participation on our part". (0/2)	University	Follow-up Given to SMEs	University	"Our main activity is accompaniment; it is what takes the most of our time, and is precisely in these monthly or bimonthly appointments that we follow the entrepreneur, and we see how it evolves and we see their questions". (1/1)
"How we apply the baseline then obviously it's all tracked on how I implement what I've learned". (3/3)	Promoters		Promoters	"The help we give to companies is long-term, which is why our department must earn their trust and build a human relationship with them". (1/1)
"There is no such thing as a systematized methodology for a follow-up". (1/4)	Public		Public	"There is a team that monitors each case, so they are given assistance in progress and evaluation of the efficiency of the activities carried out, the impact of investment on the competitiveness of the company, etc.". (1/1)
44%	Percentage of Institutions That Follow Up			100%

Significant differences were identified in the way institutions provide support to SMEs. These are mostly related to the domestic country of the institution, but also according to the type of institution.

The institutions interviewed in both countries use a website and email to provide information to and communicate with SMEs regarding their use of digital marketing. A difference appears in the use of social networks, where the institutions interviewed in Costa Rica claimed to carry out constant promotion on these different platforms, while French institutions still prefer to make direct contact with the company to report on their services.

In Costa Rica, only the university institutions do not cover digital marketing; but the other institutions interviewed, both in Costa Rica and in France, do offer a training services on this subject. And, in the case of France, this issue is seen as a part of the development process that institutions offer, rather than as an isolated subject. Regardless of the given approach for these institutions, is important to mention that the main

interest for them to include this topic in their training services is to highlight the market opportunities that SMEs could have by using these types of tools, both in foreign and domestic markets. Some of these institutions even provide SMEs a clear path to follow to reach this specific goal. Thus, digital marketing promotion seems particularly correlated with export support offered by institutions. More specifically, promoter institutions made a great effort to take SMEs to an international level. These institutions affirmed that an important part of their mission was to support mainly SMEs in their international department; these institutions support companies in terms of training, analysis, or sending data to help them prepare to start exporting.

Regarding the content of these services, the Costa Rican institutions interviewed rely on a list of tools and defined capacities, specifically those that will be taught to SMEs. Some of the digital tools most mentioned in interviews were the use of social networks, website design, and positioning in search engines, while the capabilities they teach SMEs are the creation of a digital

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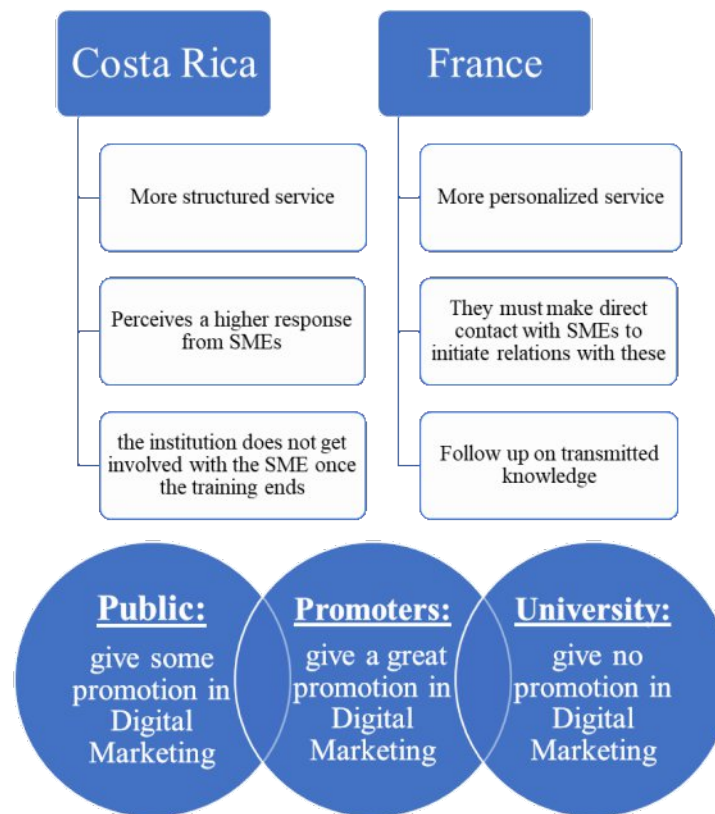


Fig. 1. How institutions promote digital marketing in small and medium international companies

marketing strategy, increasing their competitiveness, managing distribution channels, expanding their market, and strengthening their relationships with customers, suppliers, and partners. On the other hand, the institutions interviewed in France do not have these aspects clearly defined. Instead of having a fixed digital marketing offer, they provide a more personalized service, on a case-by-case basis.

Finally, we discovered that the French institutions interviewed intensively follow the development of companies served. In Costa Rica, only the promoter institutions propose a follow up. For the others, their role ends once the training has been carried out.

This research work nevertheless has some limitations, related to the number of institutions that participated in the interviews. The clear difference in the number of institutions interviewed in each country made it difficult to analyze the data collected, as well as to make a geographical comparison. For this reason, the work proposed is explorative in essence and a deeper

investigation should be carried out in order to confirm or refute the findings of this preliminary research work.

This research allowed us to build an exploratory picture of the realities that exist in both countries regarding the training given to companies, and also highlights more unknowns that would be interesting to cover in future work. For example, the number of support institutions available in each country could be a differentiating factor. France counts a notoriously smaller number of such institutions than does Costa Rica, and the organizations that predominate in the latter country and which are frequently used by SMEs are private ones. Another interesting unknown would be the preferences of SMEs when choosing an organization to acquire training, given that in Costa Rica there was a clear interest on the part of SMEs in the services offered by the institutions, as well as in France. Thus, a direct proposal design should be made for companies to attract them. A future study that can be derived from these results would be to identify the reasons why the training process in both countries is carried out in different ways.

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Keywords: Training, coaching, digital marketing, SMEs, support institutions, internationalization

Correlation between Entrepreneurial Orientation and implementation of AI in Human Resource Management (HRM)

Rico Baldegger, Maurizio Caon, Kreshnik Sadiku

“ Executives in companies around the world are increasingly looking to artificial intelligence to create new sources of business value. This is especially true for leading adopters of AI — those that have invested in AI initiatives and seen impressive results. ”

Sam Ransbotham, Philipp Gerbert, Martin Reeves,
David Kiron, and Michael Spira, 2017

This paper develops the concept of adopting artificial intelligence (AI) in human resource management (HRM) through a research questionnaire and reports the results of a study designed to investigate the perception of adopting and introducing AI in HRM processes. In addition, it investigates the correlation between entrepreneurial orientation (EO) and AI in HRM processes. A survey was conducted with a sample of 310 firm members in the HR Section *Romande*, as well as a literature review on the adoption of new technologies. The results indicate a perceived positive value of introducing AI in HRM and a correlation between the level of a company's EO and the introduction of AI in HRM. This means that the more a company is entrepreneurially oriented, the more it tends to implement or include already implemented AI projects and tools in HRM processes.

The perceived value of AI in HRM was evaluated by comparing answers to research questions involving the introduction of AI in HRM tools, and expectations of widely implementing AI in the next five years. The main barrier of adopting AI in HRM appeared to be a lack of skills and training. In addition, potential features of implementing AI in HRM were identified as potential steps toward introducing AI as a new technology. Questions regarding the evaluation of EO were based on a research Colvin Slevin (1989).

It is important for SMEs to invest in information technology to set the basis for further development. Owing to intensified competitive pressures and the necessity of entering global markets, SMEs are incrementally employing Information Technology (IT) to create substantial benefits. Most prior research has focused more on IT adoption in large organizations, yet when regarding the limited resources of SMEs, the IT adoption process is considerably different. (Ghobakhloo, Sabouri, Hong and Zulkifli, 2011).

Introduction and Background/Context

The study directly assesses the link between entrepreneurial orientation (EO) and the introduction of artificial intelligence (AI) in human resources management (HRM). The paper aims at answering the research question: *Is there any correlation between EO & the introduction of AI tools in HRM?* EO is considered in three domains: innovation, proactiveness, and risk taking. Innovation is closely linked with the companies' internationalization.

Opportunities for competitive advantage arise by introducing new products or new services. The element of risk taking also plays an important role in internationalization for assessing expansion to unfamiliar markets. Creativity and innovativeness are an undisputable tool of digitalization that make a difference in a more competitive presence in the market. Improved processes data analysis are forcing companies to invest in advancing digitalization to prepare for an inevitable future with AI introduced in HRM. Moreover, digitalization advances are helping companies move

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ahead by providing personalized services.

Company executives around the world are increasingly looking to AI to create new sources of business value. This is especially true for leading adopters of AI, that have invested in AI initiatives and seen impressive results (Ransbotham et al., 2017). Improving business performance is the primary goal of most enterprises. Innovation in finding new tools and ways of creating better processes is an everyday challenge in today's economy. Improvement in business from humans has led to a new development of employing machines with AI in the workforce. Digitalization has made computers and machines a must for today's operations.

The first ideas about AI started in the 40s, when it was widely believed that machinery could function in an intelligent manner. AI is becoming the next buzz term in the plans of the largest corporations. By developing the right AI technology, a business can improve its market position by saving time and money. This happens by automating routine processes and tasks to make faster decisions based on outputs from cognitive technologies. AI has started to be integrated in several business processes with an aim to maximize the efficiency of processes.

HRM constitutes an important segment of any company. The introduction of AI in HRM will have an impact on both management practices in recruitment and HR management in general. In this paper, we consider the gap between the promises and reality of AI in HRM and suggest how progress might be made. We identify four challenges in using data science techniques in HR practices: 1) the complexity of HR phenomena, 2) constraints imposed by small data sets, 3) ethical questions associated with fairness and legal constraints, and 4) employee reaction to management via databased algorithms (Cappelli et al., 2019).

The term "artificial intelligence" takes on new attributes every day. The term was first used in 1956 by John McCarthy, to denote "The science and engineering of making intelligent machines" (in Peart, 2019). Today's definition identifies the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages (Oxford Dictionaries of English, 2019). HR technology can be defined as any technology that is used to attract, hire, retain, and maintain human

resources, support HR administration, and optimize HRM. HR technology is increasingly being used by small, medium, and large employers to meet the needs of its stakeholders (Bulmash, 2008).

The classical theoretical debates have centered on issues of whether AI is possible at all (often put as "Can machines think?"), or whether it can solve certain problems ("Can a machine do x?"). In the meantime, technical AI systems have progressed considerably and are now present in many aspects of our environment. Despite this development, there is a sense that classical AI is inherently limited, and must be replaced by (or supplanted with) other methods, especially neural networks, embodied cognitive science, statistical methods, universal algorithms, behavioral robotics, interactive systems, dynamic systems, along with insights from biology and neuroscience, evolutionary biology, and hybrid neuro-computational systems (Müller, 2012).

Methodology

Focus and selection

The author team conducted the survey between June and July 2019 with members of the Association of HR Section *Romandes*. It was distributed by the Association to company HR departments. In total, 541 members responded and 310 were taken into consideration after being reviewed for eligibility. In total, the survey had 72 questions. Extensive research on the available literature and data on the subject was conducted. Data in AI and organizational behavior were collected, based on the supposition that AI in HRM intersects with organizational behavior.

Questionnaire

This survey research represents the main data collected for the study. With approximately 3,000 members in the HR Section *Romandes*, the sample size is 310 for a margin error of 5%, according to the platform surveymonkey for a population of 3,000.

The survey questions were designed with the 5-item Likert Scale option. The survey was developed based on a theoretical framework made by the authors, and similar to other surveys from research studies. The survey was organized in seven sections: HR process, analysis of impact, fears and opportunities, AI features, focus on recruitment, data management, entrepreneurial orientation, and demographic data.

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The survey results were analyzed using two statistical tools:

- Descriptive statistics analysis to evaluate and understand the general situation, plans, and expectations from AI in HRM
- Hypothesis testing tools (t-tests, Chi Square, and ANOVA) to find statistical relationships between variables, such as EO, readiness, and adaption of AI, including the perceived importance and fears regarding the impact of the AI, currently and in the future, in relation to easing the work of HRM, as well as fear of job losses.

Results

Application areas

The following results were found regarding the predicted impact that AI will have on business. Researchers predict that AI will outperform humans in many activities in the next ten years, such as translating languages (by 2024), writing high-school essays (by 2026), driving a truck (by 2027), working in retail (by 2031), writing a bestselling book (by 2049), and working as a surgeon (by 2053). Moreover, researchers believe there is a 50% chance of AI will advance to High Level Machine Intelligence (HLMI) in computing hardware, task performance, and automation of labor within 45 years, and will automate all human jobs within 120 years. (Grace et al., 2018). The rapid introduction of AI around the world suggests it is on the fast track to becoming an integrated part of our daily activities. Executives from the largest corporations in the USA ranked AI and machine learning as the most disruptive forces in the business landscape of the near future (New Vantage Partners, 2017). As well, a recent survey by Accenture (2017) revealed that 85% of executives have plans to invest extensively in AI-related technologies over the next 3 years (Jarrahi, 2018).

AI applications in HRM

Employing AI in HRM means delegating work from human beings to an external actor. The effect of delegation and of complementary adoption of AI, and in general of using AI to achieve pro-social interaction, is aimed at augmenting and multiplying the power of individual users to achieve their goals by exploiting the powers of other agents (Castelfranchi, 1998). The introduction and adoption of AI in the HRM process is a strong factor in determining perceptions about the

future of AI and its potential of being adopted into HRM processes in the next five years.

Our survey results indicate that 47% of respondents “partly agree” with the statement that AI will be widely used in HRM processes in the next five years. At the same time, to the survey evaluated and assessed the percentage of those that have already introduced AI into their HRM processes. 31% answered Yes. In the cross-analysis of the data, we can see a significant difference between these two statements. This leads us to conclude when companies answered Yes to having already introduced and adopted AI into their HRM processes, the more they agreed that AI will be widely used in HRM processes in the next five years. For instance, HR cloud solutions that integrate conversational AI capabilities demonstrated how cognitive engines can help employees arrive at key day to-day decisions in the workplace. Historically, HR team members, employees, or managers would have had to handle these tasks. Instead, the application of these AI-based solutions allowed HRM processes to be reorganized in order to lighten the employees’ workload (McGovern et al., 2018).

Hypotheses

The study tested the following hypotheses:

H10: *There is no positive perceived value of AI usage in HRM, and*

H11: *There is a positive perceived value of AI usage in HRM.*

H20: *There is no correlation between EO and the introduction of AI tools in HRM, and*

H21: *There is a correlation between EO and the introduction of AI tools in HRM.*

In the first group, company innovativeness was tested, based on a descriptive statistical analysis and with hypothesis testing tools (chi-square, Phi and Cramer’s V) that were used to prove statistical relationships between variables, such as EO readiness and adaption of AI. The chi-square results showed likelihood ratio results of 0.034. Based on this result, we rejected H10. In evaluating the variables’ relation with the Phi and Cramer’s V analysis, results showed a moderate relation of 0.294.

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The results of the chi-square analysis evidenced the same result in analyzing the second element of proactiveness, which resulted in our rejecting H20 and accepting H21. The Likelihood ratio was 0.001 and the analysis of the Phi and Cramer's V showed a strong relation of the variables 0.377.

The likelihood ratio for the element of risk taking was 0.001, resulting in rejecting H20. The phi and Cramer's V also showed a strong relation between variables with a value of 0.374.

Discussions

This study shows a correlation between the adoption of AI in HRM with their EO is statistically significant. This correlation suggests that the adoption of an emerging technology indeed constitutes a sign that a company is willing to take risks and is open to innovation. These factors are indeed both encompassed in the measurement of EO.

The EO of an organization denotes its processes, actions, methods, policies, practices, and decision-making styles within an organization (Mintzberg et al., 1976; Lumpkin & Dess, 1996). As such, EO shows companies that have built a basis for entrepreneurial decision-making and taking action (Lumpkin & Dess, 1996; Wiklund & Shepherd, 2003).

Being grounded in strategy as well as entrepreneurship literature (Mintzberg et al., 1976; Miller & Friesen, 1978, 1983; Venkatraman, 1989; Covin & Slevin, 1991), EO comprises a multitude of concepts from several academic fields. Using Miller and Friesen's (1983) classification of firms as a starting point, three dimensions of EO have been frequently identified and applied in research: innovativeness, proactiveness and risk taking (Morris & Paul, 1987; Miles & Arnold, 1991; Smart & Conant, 1994). This study's features involving EO in comparison with the introduction of AI in human resources, were thus assembled into three groups, according to this typology.

Internationalization

Risk taking consists of the tendency of a company to undertake risky actions, such as entering unfamiliar markets or taking on financial risk exposure actions to better perform as a way of getting ahead in the market. Thus, the impact of EO on the introduction of new technologies was first identified in the 1982 article

"Innovation in conservative and entrepreneurial firms" by Miller and Friesen. There they introduced a distinction between two types of strategic behavior: some firms are entrepreneurial, while others are more conservative. These two models of strategic momentum establish a distinction between two types of firms that lead them to insist on pursuing a given orientation. As a result, two types of innovation strategies can be identified, according to whether they are performed in response to environmental constraints (conservative strategies), or whether they proceed from top management convictions that value innovation as such, independently of the external context (entrepreneurial strategies) (Basso et al., 2009).

Empirical evidence has been found that the abovementioned measures of EO are associated with firms that perform better both in domestic and international markets (Knight, 1997; McDougall & Oviatt 2000; Dimitratos & Plakoyiannaki 2003; Kuivalainen et al., 2007; Robson et al., 2012; Wiklund & Shepherd, 2005). Each new market entry is an entrepreneurial act that involves risk taking, innovation, and proactive behavior (Ellis, 2011). This is especially true for small firms.

The null hypothesis is therefore rejected that there is no correlation between companies that are risk taking and the introduction of AI in HRM. Thus, the results from companies that engage in risk taking also showed that these companies are keen not only to enter new markets, but also to adopt new technologies. Of particular note in companies we sampled is the fact that they perceive the use of AI in HRM positively and that a considerable number are already adopting AI tools.

We analyzed the survey's results for the question, "*In general, the senior managers of my company have...*" from option 1 - *a high propensity for low risk projects (with normal and some rates of return)* to option 5 - *a high propensity for high-risk projects (with very high returns)*. As well, we addressed the question, "*Has your HR team already implemented / is it already on the way to implementing AI-focused tools / solutions?*" The results showed a likelihood ratio of 0.009, which we interpret to mean that the result is not by chance, suggesting a correlation between the two features.

Digitalization

The first dimension of EO represents the innovativeness tendency of a company to introduce new products or

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services by means of creativity and experimentation, indicating its preference for attempting technological advances through research and development. The second dimension of EO, proactiveness, reveals the approach a company takes toward opportunity seeking. This is translated into a tendency to develop and introduce new products or services ahead of competition. All of the dimensions of EO describe companies that seize opportunities for gaining competitive advantage.

Innovativeness impacts the overall performance of a company. An orientation towards innovativeness can have a positive effect on business performance as it translates into developing competitive advantage (Hurley & Hult, 1998; Hult et al., 2004). Companies interested in innovation will focus on activities that improve their capacity to do so (Hurley & Hult, 1998).

This capacity drives firms to improve continuously and, thus, tends to result in improved business performance.

The growing availability of data analysis nowadays is forcing companies to advance their technologies. Such advancement depends directly on digitalization, as the introduction of AI in HRM is closely linked with a company's EO level.

Limitations and Future Research Directions

The study was limited by a survey that had 72 questions. Approximately 42% of the responders did not complete the survey. In addition, the survey did not cover the profitability aspect of introducing AI in HRM. A further limitation in assessing the perception of AI is that it is largely a subjective matter. The surveyed persons' answers therefore might not reflect the perceptions of

Table 1. Demographics and company information of survey participants.

Size of company (full-time equivalence)					
1 to 10 employees	11 to 50 employees	51 to 250 employees	More than 250 employees		
11%	12%	22%	55%		
Activity area					
Public service	Industry	Health	Human Resources	Education	Other
16%	11%	9%	7%	7%	50%
HR workforce versus total manpower managed					
Up to 1%	1% to 2 %	2% to 5%	+5%		
30%	42%	19%	8%		
Radius of action of company					
Local	National	International			
40%	31%	29%			
Age range of respondent					
under 30 years	31 to 50 years	51 and plus			
3%	61%	36%			
Education level					
Learning	License	Bachelor	Master	Doctorate	Other
8%	32%	11%	48%	2%	4%
Field of study					
Psychology	Law	Economy	Human resources	Other	
7%	4%	23%	56%	10%	
Region					
Fribourg	Geneva	Neuchatel	Valais	Vaud	Other
9%	23%	9%	11%	42%	6%

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the company's administration.

As the study does not cover the profitability aspect of introducing AI into HRM, this field should be the next direction to assessing whether or not introducing AI in HRM will bring profit for a company.

Findings

The demographics of the surveyed sample are as presented in Table #1.

Conclusions

Global markets are volatile or uncertain at best. Talent turnover is a daily reality. Workweeks can be expected to regularly exceed 70 hours. As a result, management needs more efficiency and innovations to keep up. It has been suggested that AI has the potential to optimize processes across organizations (Oberholzer, 2019). While much uncertainty remains about what is to come with AI, nevertheless, every day the adoption and introduction of AI is becoming a necessity for business survival. The human resources sector is expecting changes and enhancements due to AI.

This study tested hypotheses regarding perceptions of AI in HRM through members of the HR Section *Romandes*. Through survey research that assessed the perceived value of AI in HRM, including its risks, constraints, and plans for its introduction, we found a general positive perception towards adopting AI in HRM. The survey results showed that the majority (71%) of those surveyed believed that there will be both disappearance of jobs and creation of employment (= same number of jobs), while 23% believed that some jobs will disappear, and 6% believed that there will be new employments created (= more jobs). Thus, the fear of a negative impact in number of job losses is low. Regarding questions about assessing the perceived value of introducing AI, the following statements give the attendant result. To the statement, "It is important for your business to have AI in HRM", from the survey, 17% strongly agreed, 47% partly agreed, 19% answered neutral, and 17% partly disagreed. To the statement, "AI becomes an indispensable tool for surviving market trends", 16% of the surveyed strongly agreed, 45% partly agreed, 26% answered neutral, 11% partly disagreed, and 2% strongly disagreed. The statement, "The use of the AI is an opportunity for the company" led to the following result: 29% strongly agreed, 48% partly agreed, 18% answered neutral, 4% partly disagreed, and 1%

strongly disagreed. To the statement, "Companies that implement AI will have a competitive advantage in the market", 14% strongly agreed, 46% partly agreed, 30% were neutral, 10% partly disagreed, and 1% strongly disagreed. The majority of those surveyed agreed with the above statements and perceived the impact of AI on HRM processes positively.

As a result of our findings, we believe that AI technology should be carefully evaluated and introduced, and that enterprises must ensure proper system information and knowledge transfer to HR employees to avoid fear of job losses and confusion. However, introducing AI depends heavily on the EO of a company. Therefore, we recommend evaluating the EO of companies considering the introduction of AI in HRM according to three dimensions: innovativeness, proactiveness, and risk taking.

The study supported the rejection of H0, that there is no positive perceived value of introducing AI in HRM. The study also supported the rejection of H20, that there is no correlation between EO and the introduction of AI tools in HRM. The result was statistically significant, showing a clear correlation between EO and the introduction of AI tools in HRM. A key priority is to ensure that the benefits of an AI system can enhance and improve HRM processes rather than harming them. Finally, the topic of AI in HRM is on the cutting-edge and thus some people are skeptical of its adoption. It is therefore now time to start preparing for what seems likely soon to come with its adoption in HR practices. Long-term planning is needed to ensure a place for AI projects. Data management drives this opportunity door for HRM, wherein companies that build a sustainable and efficient data management system today can look forward to a brighter future with AI tomorrow.

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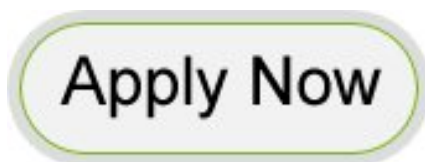


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We are currently engaged in a project focusing on identifying research and knowledge gaps related to how to scale companies. We are inviting international scholars to join the team and work on shaping Calls for Papers in the TIM Review addressing research and knowledge gaps that highly relevant to both academics and practitioners. Please contact the Editor-in-Chief, Dr. Stoyan Tanev (stoyan.tanev@carleton.ca) if you want to become part of this international open source knowledge development project.