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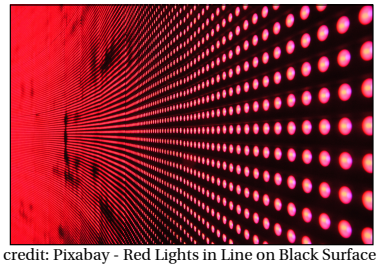
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Insights

Welcome to the July 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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Overview
The Technology Innovation Management Review (TIM Review) provides insights about the issues and emerging trends relevant to launching and growing technology businesses. The TIM Review focuses on the theories, strategies, and tools that help small and large technology companies succeed.

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.

We welcome input from readers into upcoming themes. Please visit timreview.ca to suggest themes and nominate authors and guest editors.

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About TIM

The TIM Review has international contributors and readers, and it is published in association with the Technology Innovation Management program (TIM; timprogram.ca), an international graduate program at Carleton University in Ottawa, Canada.

Editorial: Insights

Stoyan Tanev, Editor-in-Chief and Gregory Sandstrom, Managing Editor

Welcome to the July issue of the Technology Innovation Management Review. This issue consists of a mixture of "Insights" into digital platforms, data analytics, data-driven business models, digitalization, international business, digital entrepreneurship, digital technologies, SMEs, foresight, and innovation, with uses cases in the food industry, the circular economy, and tourism.

The issue begins with "The Role of Analytics in Data-Driven Business Models (DDBMs) of Multi-Sided Platforms (MSPs): An exploration in the food industry" by **Diane Isabelle, Mika Westerlund, Mohnish Mane** and **Seppo Leminen**. The authors present research on digital platforms, a theme of growing familiarity in the TIM Review, with a study of DDBMs related to the food industry. They note that "many aspiring MSPs lack effective strategies for using data to establish a profitable data-driven business model" (p. 5), and that "[s]tudies on DDBM of MSPs in the food industry context are practically non-existent in spite of several fundamental changes in consumer behaviours, along with novel offerings and business models". (p. 8) From their study, they identify eight key factors involved for companies with data-based analytics and value creation, as well as elaborating on the notion of "boosters" for MSPs, that can help companies integrate DDBMs in their strategic planning.

This is followed by **Gabriel Linton** and Christina **Öberg**'s "A Conceptual Development of a Business Model Typology in Tourism: the impact of digitalization and location". Their primary aim is "to conceptually develop a business model typology in the tourism sector" (p. 17). The authors identify and discuss four business model archetypes: (1) bricks and mortar business models, (2) digitalized destinations, (3) create-a-destination, and (4) intermediary business models. The authors argue that "it is not only about matching business models with the tourism sector, but also about taking contextual factors into consideration" (p. 23). Their research takes a configurational approach to look at various features of digitalization, location, and technology in exploring how they impact tourism business models.

Annaële Hervé, Christophe Schmitt and **Rico Baldegger** continue the "Internationalization and Digitalization" theme from their previous article in the April 2020 TIM Review (https://timreview.ca/article/1343). Here they focus on SMEs in "Applying digital technologies to the internationalization process of small and medium-sized enterprises". Their research on international business and digital entrepreneurship opens new ways of analyzing how companies are adapting and adjusting to incoming digital technologies, which they believe can be used to the advantage of SMEs. The strategies and models in this paper can be of value for companies looking to expand their products or services in global markets with the aid of online tools, services, and digital platforms.

The final paper is "Using Foresight to Shape Future Expectations in Circular Economy SMEs" by **Anne-Mari Järvenpää, Iivari Kuuntu** and **Mikko Mäntyneva**. The authors encourage companies and innovators to begin planning for the near future by using "foresight" principles, which they apply to the sustainability-focused topic of the "circular economy". The attention on SMEs in their research involves "how companies predict future changes, challenges, and opportunities in their operational environment considering the political, economic, social, technological, environmental, and legal (PESTEL) aspects" (p. 44). They then apply the PESTEL framework to conduct a qualitative case study on seven Finnish circular economy-oriented SMEs. Their aim by comparing these SMEs is to identify competitive advantages for companies that are coming up with new innovations and customer solutions.

The TIM Review currently has a *Call for Papers* on the website for a special edition on "Aligning Multiple Stakeholder Value Propositions". For future issues, we invite general submissions of articles on technology entrepreneurship, innovation management, and other topics relevant to launching and scaling technology companies, and solving practical problems in emerging domains. Please contact us with potential article ideas and submissions, or proposals for future special issues.

Stoyan Tanev, Editor-in-Chief
Gregory Sandstrom, Managing Editor

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Keywords: Digital platforms, data analytics, data-driven business models DDBM boosters, food industry, business models, configurations, destination, digitalization, location, technology, tourism, typology, nternationalization, international business, digital entrepreneurship, digitalization, digital technologies, SMEs, foresight, circular economy, SMEs, innovation, PESTEL

The Role of Analytics in Data-Driven Business Models of Multi-Sided Platforms: An exploration in the food industry

Diane Isabelle, Mika Westerlund, Mohnish Mane and Seppo Leminen

> *"It's not what you look at that matters, it's what you see."*
>
> Henry David Thoreau
> American philosopher

The collection and use of data play an increasingly important role in the growth and success of today's digital multi-sided platforms (MSPs). However, many aspiring MSPs lack effective strategies for using data to establish a profitable data-driven business model (DDBM). This study explores how MSPs in the food industry can utilize data to develop such a DDBM. Based on an analysis of seven illustrative cases of high-growth MSPs, namely food delivery and meal kit providers, the study identifies eight factors that reveal the role of analytics in those firms' DDBM, and further classifies them into three DDBM boosters. The findings contribute to our extant knowledge on MSPs and DDBM by addressing how digital platforms in the food industry can leverage big data to optimize their current business processes, predict future value of their product and service offerings, and develop their partnerships.

Introduction

Data-driven business models (DDBMs) are either emergent or new multi-layered, multi-dimensional business models enabled by big data(Hartmann et al., 2016). Several highly diverse industries are moving towards DDBM to survive and compete. Such industries include especially those in which understanding user-buying patterns in an in-depth manner is becoming increasingly important, such as online retailers, the publishing industry, and the financial and insurance service sectors (Brownlow et al., 2015; Zaki et al., 2015). More and more, big data and data analytics play an enabling role in the growth and success of multi-sided platform (MSP) firms, which are digital platforms connecting and serving two or more stakeholders (Evans, 2003; Hagiu, 2006, 2015; Rochet & Tirole, 2006). The MSP strategy has been fundamental to the emergence of many of today's leading digital businesses from Apple and Google to AirBnB and Uber (Ikeda & Marshall, 2019).

The analytics, use, and monetization of data are increasingly crucial for the profitability and sustainability of MSPs (Trabucchi et al., 2017). Previous literature shows that apart from revenue growth and cost optimization, data analytics can decrease customer acquisitions costs, retain valuable customers, help predict customer behaviour, improve customer experience, reduce fraud, provide real time offers, and enhance decision making (McAfee & Brynjolfsson, 2012; Redman, 2015; Wamba et al., 2017). However, data on its own is not a source of competitive advantage since all firms can collect hordes of data from a variety of sources. Rather, data must be purposely analyzed, and activated. Nonetheless, firms face a host of issues - organizational, financial, physical, and human resources - in their attemps to create a competitive capability from the use of data (Gupta & George, 2016; Ghasemaghaei, 2018), and may easily fail to exploit the benefits of data analytics (Erevelles et al., 2016).

Despite DDBM and data monetization being of high interest to companies (Moro Visconti et al., 2017) and the recent increase of scholarly studies in this domain (Amado et al., 2018; Fiorini et al., 2018), research conducted involving factors that characterize data-based value creation and its role in companies' business

models are lacking (Lim et al., 2018). In particular, empirical studies on the potential of DDBM innovation in digital platforms to create and appropriate value from big data (Clarke, 2016) and overcome value creation barriers (Lim et al., 2018) are scarce. Given that MSPs constitute an increasingly important business strategy in today's digital economy, there is an urgent need for a better understanding and more comprehensive view of the role of analytics in successful MSP firms' business models.

Our research question for this paper is as follows: *How can MSPs successfully establish a new DDBM or strategically shift their current business model to a DDBM through the use of data analytics?* To explore this question, we selected the food industry for our investigation, specifically, food delivery and meal kit providers, which is an under-investigated yet growing subcategory of MSPs sharing quite similar business models (Pigatto et al., 2017). At the same time, this highly capital-intensive industry is faced with some challenging issues: customer acquisition costs tend to be very high, while customer retention is generally low, and both supply-chain and logistics are often costly. These challenges can rapidly lead to unprofitable business models even though customer demand for food MSPs is growing. Firms in that industry are generally funded by investors; therefore, it is imperative that their business models generate sustainable results and profits (Ladd, 2018). Hence, this industry represents a particularly fertile area for investigating DDBMs.

Drawing from Lim et al.'s (2018) framework, the objective of this study is to identify essential factors that characterize data-based value creation and its role in DDBM in the food delivery and meal kit industry, through the use of an illustrative case methodology. In so doing, we identify eight key factors that illustrate the role of data analytics in DDBM of successful food MSPs and advance the theoretical concept of "boosters" (Leminen et al., in press), with a study of three boosters that enable successful DDBMs in the food industry. The contributions of the present study to the nascent body of knowledge on DDBMs for digital platforms are as follows. The research, 1) enhances our understanding of how MSPs in the food industry can utilize data analytics to develop a DDBM, 2) fills a gap between big data acquisition and data-based value creation, and 3) provides managers in the food industry with a comprehensive and applicable approach for developing a data-driven model and integrating it with their MSP strategy to successfully achieve a transformation toward a DDBM.

Literature Review and Research Overview

Big data is defined by five key attributes, commonly referred to as the Five Vs: Volume, Variety, Velocity, Value, and Veracity (McAfee & Brynjolfsson, 2012; White, 2012; Leventhal, 2013; Fiorini et al., 2018). Value is considered the most important of these attributes (Hmoud et al., 2017). Value can be financial (for example, increased revenue and reduced costs) or intangible (for example, improved customer satisfaction and informed strategic decisions), or a combination of both. While the other four attributes stress data collection, the creation and appropriation of value defines the potential and means for monetization or benefitting from data (Lim et al., 2018). Of note, two recent information technology trends have enabled companies to obtain more value from data: business intelligence and analytics, along with cloud computing (Moro Visconti et al., 2017).

Big data can be classified into three higher level types, namely, structured, semi-structured, and unstructured. Approximately 80 percent of the world's data is unstructured (Balducci & Marinova, 2018; Sun & Huo, 2019). Hence, big data often means high volumes of heterogeneous data, which brings unprecedented opportunities to benefit from that data. In fact, previous literature has found that firms using analytics are 36% more likely to surpass their competitors in revenue growth and operating efficiency (Marshall et al., 2015), and can decrease their customer acquisition costs by 47% (Wamba et al., 2017).

Redman (2015) identified four types of DDBM: 1) *pure content provision*, such as Bloomberg corporation; 2) *informationalization*, which is building data customers need, for example, Waze for route guidance; and 3) *infomediation*, that is helping people find the data they need, for example Google. The potentially most profitable model looks to become 4) *data-driven*, by using more and better data to improve strategic and operational decision making, which is the business model of our selected meal kit and food delivery industry.

Engelbrecht and colleagues (2016) argue that innovating business models from a data-driven perspective is crucial to long-term success, while de Oliveira & Cortimiglia (2017) believe that monetization should

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focus on the scalable parts of the business model. Accordingly, firms can use big data, including user-generated data, to develop new business models, update and customize existing offerings, and integrate business partners in future business models (Hartmann et al., 2016; Dubé et al., 2018). Without a doubt, the strategic use of data is fast becoming one of the key pillars for successful digital platform business models (Ikeda et al., 2019).

Digital platform businesses have been explored in the network externalities literature (Katz & Shapiro, 1985). They enable co-creating value among distinct user groups through an intermediary who can internalize network externalities associated with these groups (Evans, 2003; Zott & Amit, 2010). Hence, conceptualizing a strong value proposition becomes even more complex, as it requires an understanding and management of several needs and objectives across a network of multiple stakeholders to result in creating shared value (Porter & Kramer, 2011; Baldassarre et al., 2017).

In spite of the growth of data, along with the trends in digital business models and expected benefits from DDBMs, a recent global survey of ~400 companies showed that 77% of companies do not have strategies to use big data effectively (Wang et al., 2015). Many companies are thus failing to benefit from integrating big data into their business models (Andersen & Bjerrum, 2016). The literature offers several reasons for such failures. According to Morabito (2015), big data emphasizes '*utility from*' data rather than '*ownership of*' data. This means that access to purposeful data is key. Further, raw data is useless unless it is purposely analyzed (Morabito 2015; Gupta & George, 2016). Jones (2019) notes that there is a difference between data that can be recorded and data that actually gets recorded, as well as between the results from data analyses that get extracted, understood, and exploited for business benefits. Companies also often lack data analysis competencies (Koskinen, 2018).

Vidgen et al. (2017) summarize the top five data strategy issues to overcome: 1) availability of data, 2) using analytics for improved decision making, 3) managing data quality, 4) creating a big data and analytics strategy, and 5) building data skills in the organization. Compounding these issues, business managers must also consider privacy and security concerns, as well as growing regulations (Wong, 2012; Blazquez et al., 2018), and continually develop their business models over time (Muzellec et al., 2015). Not surprisingly, few companies have succeeded in leveraging data and creating a successful DDBM (Mathis & Köbler, 2016) by linking analytics and big data for value capture (Trabucchi et al., 2017).

More research is needed to provide organizational managers with guidance in these areas (Sorescu, 2017), as evidenced by the gaps in the literature between big data and value creation (Vidgen et al., 2017; Lim et al., 2018). Hence, our objective is to identify key factors that enable multi-sided digital platforms in the meal kit and food delivery industry either to successfully establish or revise their current business model into a DDBM. We draw from Lim and colleagues' (2018) framework for data-based value creation in information-intensive

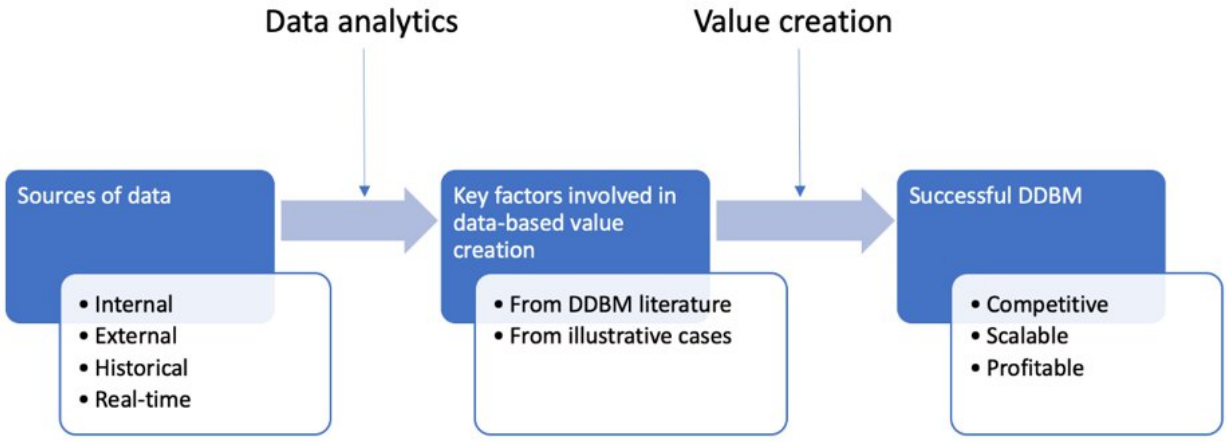

Figure 1. Research overview

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services, and illustrate the context of our research in Figure 1.

Research Design

Studies on DDBM of MSPs in the food industry context are practically non-existent in spite of several fundamental changes in consumer behaviours (different eating patterns, healthy eating trends, rise of vegan food, preference of ordering in and take-out, etc.), along with novel offerings and business models (online ordering, ready-meal kits delivered to offices and home doors, nutrition-optimized customized meals, etc.). Therefore, learning from existing solutions in an industry, either long established or recently emerged, is an efficient way to contribute to research on business model innovation (Remane et al., 2017).

Applying our research overview approach (Fig. 1), which we drew from Lim and colleagues (2018), we first conducted a literature review of MSPs and DDBMs to identify key factors involed in data-based value creation. Following the example of Leminen and colleagues (2020), we then adopted an illustrative company cases approach by selecting high growth digital platform firms in the meal kit and food delivery industry. We explored their business models and contrasted their key features with these factors found in the previous literature. Our goal was to identify key factors that characterize data-based value creation of successful DDBMs for MSPs in the food industry. This research approach is deemed suitable based on exploratory retrospective intent.

We then proceeded to search for suitable data sources. Data were collected in 2018 in two stages, using an archival research method. In the first stage of data collection, we searched Crunchbase to gather data on MSP firms in the food industry. Initially, 200 companies were found, using MSPs in the food and beverage industry as a high level search criteria. We then further filtered using criteria aligned with the objectives of our research, that is, successful and high growth MSPs providing meal kits and food delivery service that had an established DDBM, and were operating at the time of the study. We applied the following criteria from the literature related to firm survival and high growth: age (over 3 years), customers (over a million), and annual revenue growth rate (over 50%). As a result, seven MSPs headquartered in the U.S. and Europe were chosen as illustrative cases. Despite a relatively small sample, our criteria and selection of a specific industry niche allowed us to identify key attributes of successful DDBMs in that industry. Other researchers have used similar approaches given the infancy of the DDBM field (Morris et al., 2013; Trabucchi et al., 2018).

In the second stage of data collection, we individually analyzed the selected seven MSPs through content/archival data analysis to provide accurate accounts of how they achieved successful DDBMs. Data used for this purpose were gathered through various information sources, such as company websites, industry blogs, app stores offering those companies' applications, news media, industry journals, and magazines. News sources included *CNBC, Wired, TechCrunch, Business Insider, VentureBeat*, and *Business Times* among others.

We gathered and organized the data on each of the seven cases and conducted content analysis. We were looking for any indications of whether and how these MSP firms had adopted data analytics to support and innovate their DDBMs. We then wrote short case descriptions of each company focusing on how their internal and external data were leveraged in their DDBM and operations. Thereafter, we performed a comparative analysis to find key (dis)similarities across the cases. Table 1 summarizes the seven illustrative cases.

Finally, we contrasted the identified key factors related to the use of data with those identified in the DDBM literature and classified such factors into DDBM boosters enabling successful DDBM of MSPs in the food industry. These factors characterize data-based value creation resulting in competitive, scalable and profitable DDBM in that industry.

Findings and Discussion

From our analysis, we identified eight key factors involved in the role of analytics and data-based value creation by these successful firms' DDBM. These eight factors were identified and defined through our literature review and an in-depth analyses of various data sources related to our selected MSP cases in the food industry. In particular, we investigated how the MSPs leverage their internal and external data, as well as key performance aspects of their operations. The resulting factors include market trends, real time operations, cross-industry affiliation, optimization of delivery, customer orders, customized recommendations, customer seasonal demands, and

business results of media plans (see Table 2 for definitions). We further classified these factors into three DDBM boosters: optimization of current services, prediction of future value, and development of partnerships, illustrated in Figure 2.

Table 3 summarizes the results of our analysis by showing which factors appear in each case.

The most widely used data analytics in our cases was for tracking *market trends*. For instance, Hello Fresh makes data-driven decisions by harnessing Google's keyword planner to analyze trends in searches at specific periods of time. The firm also performs data analyses on dishes that people eat at restaurants. GrubHub uses data to identify upward trends such as meals in bowls and vegan dishes. Deliveroo has established its own business intelligence units in the Asia Pacific region. Their market trend analyses include exploring food habits and trends, using advanced analytics, data science, and local insights. Further, the company shares its data on customers' preferred dishes to restaurant partners.

Another important factor is *real-time operations*. Deliveroo analyzes and compares the supply of available delivery drivers with demand based on customer location. Specifically, they use machine learning algorithms to compute the most optimal delivery solution both from the perspective of customers and delivery drivers. Similarly, Good Eggs uses data to deliver groceries to their customers in half the time compared to traditional grocery stores. That said, their real-time operation factor is more about using dynamically changing external data such as weather conditions or traffic data to optimize operations, for example, to

Table 1. Overview of the illustrative cases

Company	*Business*	*Headquarters*	*Funded*	*Employees*	*Funding received*	*Services*
Hello Fresh	Meal kits	Berlin, Germany	2011	51-100	365M$	Weekly subscription model. Most popular in Canada.
GrubHub	Online food delivery	Chicago, US	2004	500-1000	284M$	Connects customers with local restaurants in US & UK. Provides delivery for restaurants.
Deliveroo	Online food delivery	London, UK	2012	101-250	860M$	Europe, Australia and South Asia.
Gobble	Meal kits	California, US	2010	11-50	30M$	Meals can be prepared in 15 minutes with one pan. Customized recipes based on customer feedback
Blue Apron	Meal kits	NY, US	2012	500-1000	119M$	US only. Customized recipes in recyclable and sustainable packaging
Good Eggs	Organic grocery delivery	California, US	2011	251-500	65M$	Works with local farmers and food makers to deliver groceries in half the time of traditional grocery stores
Chef'd	Meal kits	California, US	2013	101-250	41M$	Charged per meal. Partnered with famous world chefs.

Table 2. Description of identified key factors

Factor	*Description*
Market trends	Past and current market behaviors. General tendency or a course of events over time. Could be short or long time frames.
Real time operations	Series of operations performed on data as it comes in, to serve real-time applications
Cross-industry affiliation	Partnerships between two or more firms that are from different industries for mutual financial benefit.
Optimization of delivery	Provision of the fastest delivery service to customers, by processing and analyzing data to find the best possible delivery solution via algorithms incorporating relevant factors.
Customers' orders	Analysis of past data to identify customer preferences, modify the business model to better suit their needs, and increase revenue.
Customized recommendations	An understanding of customers' preferences from current customers, using current and past data to offer personalized choices.
Customer seasonal demands	An understanding of specific popular food dishes during specific time periods (e.g., religious, cultural) and adjusting offerings accordingly.
Business results of media plans	Using algorithms and artificial intelligence to analyze the outcomes of media plans and feed insights into the strategic decision-making process.

anticipate the demand for cold drinks on a sunny day.

An example of *cross-industry affiliation* is the partnership between Chef'd and *Men's Health Magazine* for the purpose of sharing customer data and gaining mutual access to each other's customer base. Chef'd has also partnered with famous chefs to plan meals and content that appeal to readers. Likewise, *Men's Health Magazine* readers can subscribe to Chef'd meal plans to help achieve their fitness goals. Likewise, Chef'd customers looking for a healthy lifestyle are referred to *Men's Health Magazine*, and receive special discounts for subscription. Thus, customers from one side of the platform benefit from services on the other side.

Optimization of delivery means providing the fastest delivery service to customers. Both internal and external data such as customer orders, number of delivery drivers available, expected time for the meal to be ready, meal packing time, traffic conditions, and navigation maps are processed and analyzed to find the best possible solution to serve customers. Deliveroo uses Frank, a machine learning algorithm capable of calculating thousands of operations per second to provide an optimal delivery solution. This helps them decrease delivery time and thus also helps delivery drivers earn more money in tips.

A factor when stressing historical data is *customer orders*, which refers to analyzing past customer data accumulated over a period of time. This generally does not involve real-time data and does not focus on customizing offers, but rather on gaining a better understanding of the customer base and their behaviors. Historical data can help reveal insightful correlations that are helpful in modifying the business model. Such data can include correlations between demographics

Table 3. Comparative business model analysis of illustrative cases

	Hello Fresh	*GrubHub*	*Deliveroo*	*Gobble*	*Blue Apron*	*Good Eggs*	*Chef'd**
Market trends	√	√	√			√	
Real time operations			√			√	
Cross-industry affiliation					√		√
Delivery optimization			√			√	
Customer orders		√	√	√			
Customized recommendation				√			
Customers' seasonal demands	√	√					
Business results from media plan					√		

* has since gone out of business and subsequently acquired by True Food Innovations.

and the type of food that residents in a specific neighbourhood order. For example, GrubHub contrasted past customer orders and weather data and found that their customers preferred mac'n'cheese on a cold day. Results are then used to modify the business model to better suit customers and increase revenue.

Customized recommendations refer to understanding what the existing customer values. Both current and historical data are analyzed to find a customer's favorite recipes and ingredients. For instance, an analysis may show that a customer always likes their sandwich with honey mustard, rather than chili mayonnaise. In this vein, current and new market offerings can be personalized according to customers' preferences, and then suggested for customers to try, as does Gooble, a small MSP firm offering dinner meals that can be prepared in 15 minutes with just one pan.

Data analytics is also used to ensure that the MPS's offerings are aligned with *customers' seasonal demands*. This process involves understanding what food dishes are popular during a specific season. Based on analytics, suitable dishes are then created and served to customers during that time period. This means identifying the season's demand through customer data, which can include, for instance, knowledge about customers' traditional celebration needs for certain religious observances or cultural festivals. For example, Hello Fresh uses data analytics along with knowledge of holidays like Thanksgiving Day to prepare turkey and pumpkin-related recipes.

Finally, our cases highlight a factor related to predicting the impact of *media plans*. Blue Apronis is affiliated with a third-party media company that uses predictive analysis and artificial intelligence to study how well investments in advertising are paying off. Data analytics thus serves to provide the firm with an optimum media mix by providing a forecast of the expected business results of a media plan or ad campaign, helping Blue Apron make informed strategic advertising decisions to achieve cost savings and improve impact.

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Figure 2. Classification of key factors and DDBM boosters in the food industry

Our findings highlight that Chef'd, which —despite the initial growth and success —went out of business in late 2018, only used one of our eight factors. It eventually ran out of capital before being able to establish a sustainable and profitable business model in what is now becoming a competitive industry landscape. We can see from Table 3 that none of our selected succesful firms took full advantage of all the recommended factors.

We classified these eight identified factors into three distinct DDBM boosters: 1) optimization of current services, 2) prediction of future value, and 3) development of partnerships. Real time operations, optimization of delivery and customized recommendations. These form the optimization of current services booster. Market trends, customer orders, and customer seasonal demand fall under the prediction of future value booster. Finally, cross industry affiliation and business results of media plans fall under the development of partnerships booster. Figure 2 illustrates the classification of DDBM.

Conclusion

Our objective in this paper was to understand how digital MSPs in the high-growth food industry, specifically meal kit and food delivery firms, can leverage data analytics to establish or adapt their business model toward a DDBM. In so doing, we aimed to identify key factors that characterize seven successful DDBMs in that industry. In summary, we identified eight factors that reflect the use of data analytics by MSPs in the food industry, then further classified three DDBM boosters: 1) optimization of current services, 2) prediction of future value, and 3) development of partnerships. These boosters highlight that successful DDBMs are ambidextrous because they focus simultaneously on the efficiency of current business and effectiveness of future business, while also increasing the interdependence in company value networks. These findings are parallel to those of Khanagha et al. (2014) who investigated business model renewal during transition to a cloud business model. Companies employing these approaches have been found to be better positioned to increase sales, improve human resource efficiency, provide better customer service, reduce marketing costs, provide optimized delivery service to customers, predict demand in a more accurate manner, improve value

propositions, and create new offerings and partnerships. Our findings are therefore particularly relevant in the highly competed food industry in which many companies are currently struggling to create profitable DDBMs.

Theoretical contributions

The results of the study contribute to the current body of knowledge on DDBMs in several ways. First, our findings support the arguments that data analytics, especially machine learning and artificial intelligence-based analytics methods, can be deployed both on internal and external data to achieve cost optimization in online food delivery. This is a key service across most food MSPs and one of the fastest growing areas in the industry (Pigatto et al., 2017). Specifically, analytics can be used to calculate the optimal delivery solution that takes into consideration multiple variables, such as the number of delivery drivers, route traffic, and estimated meal packing time. Second, our results highlight that data analytics plays a key role in the DDBMs of food delivery MSPs in other ways beyond meal delivery. Thus, they suggest that the capability of conducting big data analyses and inclusing analytics as a key element of a company's business model are necessary to create value and gain a competitive advantage (Gupta & George, 2016). Third, drawing from previous business model design and innovation literature (Khanagha et al., 2014; Zott & Amit, 2020) our study extended the theoretical concept of "booster", put forth by Leminen et al. (forthcoming), suggesting that DDBM boosters can enable successful data activities in the food industry.

Practical implications

Our findings provide managers in the food industry with a comprehensive and applicable strategy to develop a data-driven approach that can be integrated with their MSP strategy to successfully achieve transformation toward a DDBM. MSPs operating in the food business should develop their data analytics capabilities and adopt continuous data analysis practices on historical and/or real-time data as a part of their business model, focusing on the eight key factors identified in this study. While internal data are relevant to better understand a company's customers, there is ample external data available that can generate value to MSPs with analytics capabilities. For instance, MSPs can pursue developing their business toward a DDBM by leveraging seasonal demand from data analytics.

Further, environmental and cultural factors such as climate, weather, seasons, festivals, and special occasions, must be diligently considered. Such data-driven decisions will help revenue growth. However, data tends to accumulate, resulting in big data that can be challenging to manage, especially since much of this data is unstructured. Compounding this situation, a key issue is finding skilled labor and developing data analytics capabilities to use business intelligence systems. Collaboration within and across industry sectors can also help in promoting services, while partnering with a media analytics company can assist MSPs in predicting the outcomes of their media advertising costs, using predictive analytics and artificial intelligence.

Limitations and future research areas

The meal kit and food delivery business area that we selected for investigation is a rapidly growing yet relatively new subsection of the food industry. Therefore, we used an illustrative case approach of successful MSPs for this study. This enabled us to reach a better intra-segment generalization of the results. We further believe that our results and the resulting classification of DDBM boosters are generalizable to other MSP industries.

Future research on MSPs in the food industry could examine a larger sample of companies to gain richer data and insights on analytics practices, as well as validate the link between data analytics and the successes of DDBMs. New entrants have since emerged in that space, which could exemplify additional DDBM factors. Testing the applicabilty of our research approach and performing a case study that could demonstrate the value of our booster concept in business model design and innovation are other potential avenues for investigation. Since studies related to MSP successes and failures are still largely lacking (de Reuver et al., 2018), future research could build from our identified factors, to consider both successes and failures (Stummer et al., 2018), perhaps using a longitudinal research perspective and a business model lifecycle approach (Muzellec et al., 2015). Nonetheless, we believe that the results illuminate that uses of big data in food platform businesses will help MSPs develop more successful DDBMs.

The Role of Analytics in Data-Driven Business Models of Multi-Sided Platforms: An exploration in the food industry

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A Conceptual Development of a Business Model Typology in Tourism: the impact of digitalization and location

Gabriel Linton and Christina Öberg

> *"Luck is not a business model."*
>
> Anthony Bourdain
> Chef, author, and travel documentarian

This paper aims to conceptually develop a business model typology in tourism. It focuses on digitalization and destination location as important contextual factors when developing the typology. The paper builds on prior research on business models and tourism research by adopting configuration theory to create a typology of business models in tourism businesses. Four business model archetypes are identified: (1) bricks and mortar business models, (2) digitalized destinations, (3) create-a-destination, and (4) intermediary business models. The typology contributes to the literature by identifying different types of business models in the tourism sector. The typology also helps to ground the business model concept theoretically, something that has been considered as missing in previous business model research.

1. Introduction

Technological development within tourism has enabled a change in consumer behavior, led to the emergence of new actors entering the sector along with widespread *digitalization* (Boksberger & Laesser, 2009; Laesser et al., 2009; Koukopoulos & Styliaras, 2013; Kubiak, 2014; Wernz et al., 2014). This, in turn, has resulted in new ways of designing businesses (Burger & Fuchs, 2005; d'Angella et al., 2010; Zach & Racherla, 2011; Zach, 2012; Krizaj et al., 2014). Beritelli and Schegg (2016), for instance, describe online booking systems, Yu (2016) points at e-tourism, Scheepens et al. (2016) refer to sustainability initiatives, and De Carlos et al. (2016) indicate how online booking systems introduce new actors in the tourism sector, as do Kathan et al. (2016), and Forgacs and Dimanche (2016) in relation to platform-based businesses. These new business designs reflect some ongoing changes to *business models* in the sector (Osterwalder et al., 2005; Zott et al., 2011) and suggest the possibility of structuring different ways to operate within tourism. A business model can be defined as a system of interdependent activities of a firm, its business partners, and the mechanisms that link these activities (Zott & Amit, 2010). In short, it is the way a firm operates its business.

The increased variety of business model designs in the tourism sector (Martins et al., 2015) draws attention to how various business models may fit in different situations and for different purposes (Zott & Amit, 2013). Through configuration theory, it is possible to conceptually identify archetypes, or in other words, well-performing business model configurations. The purpose of this paper is *to conceptually develop a business model typology in the tourism sector.* The theoretical basis for deriving a typology of business models (Baden-Fuller & Morgan, 2010) draws on a configuration approach, which takes into account contingency factors of *digitalization* as well as company location. In tourism research, the *location* of a firm is a central theme that focuses on topics such as accessibility and attractiveness of destinations (Henderson, 2006). The location as an external factor is thereby stressed more extensively for business models in tourism than in many other sectors. Digitalization has been shown to change the way tourism operates, including intermediation and peer-to-peer (P2P) sharing. Gardiner and Scott (2018), for instance, discuss how digital innovation in tourism has changed the ways companies conduct their business.

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The paper contributes to previous research in multiple ways. While several scholars have discussed the emergence of new business models in the tourism sector, the discussions remain quite fragmented, and no attempts have been made to structurally present these, nor to describe them in terms of individual configurations, and how the parts of the configurations fit (or align) together. From a theoretical point of view, the suggested typology provides an important and contemporary overview of business models in the sector, something which is important given the sector's ongoing development (Brannon & Wiklund, 2014). The tourism sector is expanding based on the increased wealth and travel of individuals making it an important sector to study. Digitalization opens the way for a contemporary understanding of the sector.

The use of configuration theory to derive the typology offers a way to conceptualize business models, as well as helping to enable the theoretical grounding of business models in general (Chesbrough & Schwartz, 2007; Johnson et al., 2008; Demil & Lecocq, 2010; McGrath, 2010; Teece, 2010; George & Bock, 2011; Foss & Saebi, 2017). From a practical point of view, the typology helps to guide actors that are either in or entering the sector to design business models that fit their purposes depending on the company's technology level and location. Most previous studies on business models concern high-technology companies and collaborations among relevant stakeholders. The focus on tourism offers an opportunity to expand the empirical base for business model studies.

The next section introduces business models and the configuration approach, followed by a section that briefly discusses how digitalization and a company's location have an impact on its business model. Thereafter, various settings are discussed based on digitalization and location, along with the business models most likely to best fit each setting. The paper's theoretical contribution, managerial implications, and further research agenda are discussed in the concluding section.

2. Theoretical Background: Business models, configuration theory, and tourism

2.1 Business models

A business model refers to how a firm operates its business and is a central instrument for tourism companies. Research in the business model area is extensive, capturing both strategic and entrepreneurial discussions of business models (Zott & Amit, 2013; Mangematin & Baden-Fuller, 2015; Martins et al., 2015; Taran et al., 2016; Molina-Castillo et al. 2019). There are numerous ways of conceptualizing business model components. Teece (2010), for instance, refers to business models by focusing on how companies deliver value to customers, attract customers to pay for the value, and obtain profits from the value deliveries. Magretta (2002) similarly describes business models as dealing with customers, value creation, and delivery, while also including the economic logic of the company. While both Teece's (2010) and Magretta's (2002) descriptions may appear as one-sided business models that focus only on customer offerings, they also include how a company organizes its business to achieve those value offerings.

Osterwalder et al. (2005) explicitly refer to resource provisions, in addition to value created and offered to customers, thus emphasizing a holistic view of how business is operated (Bolton & Hannon, 2016). Zott and Amit (2010), in a similar holistic way, describe activities in terms of their content, structure, and governance, including both the provision and offering of a company and its business partners. An often-denoted characteristic of business models is how they extend across company boundaries, as well as incorporating parties from various industries (Schweizer, 2005; Zott & Amit, 2013). Chesbrough (2007), for instance, introduced the concept of open business models that focus on how multiple parties are involved in the value creation process.

This paper describes the components of a business model as activities that center around the focal company (Zott & Amit, 2013; Heilbron & Casadesus-Masanell, 2015; Martins et al., 2015), including the activities of business partners, customers, and vendors (Zott & Amit, 2010). The paper follows Zott and Amit's (2010) conceptualization of business models as activity systems, where *content* refers to what activities are selected and performed in the business model, *structure* describes how those activities are linked, and *governance* depicts who performs the different activities.

2.2 Configuration theory

The notion of a business model as an activity system (Zott & Amit, 2010) emphasizes that distinct activities in a business model are often interconnected with other activities, as well as the significance of alignment among the activities (Siggelkow, 2002). The fundamental

reasoning is that there is no generic, single best way of organizing or executing business activities. Instead, firms can reach high performance when activities make a good fit with each other, and also fit with the specific business context. This is when an alignment between factors such as strategy and structure, together with different contextual factors such as technology or environment is achieved (Drazin & Van de Ven, 1985).

Three different types of fit have been described in previous research (Drazin & Van de Ven, 1985; Venkatraman, 1989). One type indicates how business model activities fit with strategy (Porter, 1996) by ensuring how the consistency between activities and strategy leads to competitive advantage (Spieth et al., 2016). A second type of fit refers to a business model dyad, when two different activities mutually reinforce one another (Milgrom & Roberts, 1995). And, a third type of fit includes the business model architecture, which goes beyond bivariate investigations to take a *configurational approach* to optimizing the entire set of activities (Morris et al., 2005). The third is the type of fit that is adopted in this paper, which thereby includes contextual items as contingency factors. This type fits well with the holistic view of business models as it can elaborate on the many different factors that contribute to the overarching approach of a company's operations.

Our research focusing on configurations is not intended to be exhaustive, but rather to show important relationships, while we acknowledge that there are always many viable configurations which cannot be accounted for. By identifying some typical configurations, however, it is possible to go beyond the "one-variable-at-a-time" approach (Miller, 1996). This way the variables become meaningful as a collective rather than individually (Dess et al., 1993). Two related terms to configuration research, which also go beyond it, are *typologies* and *taxonomies* (Short et al., 2008). The difference between *typologies* and *taxonomies* is that typologies are based on theoretical types and are conceptually determined by the researcher, while taxonomies are classes (or kinds) that are found empirically and developed bottom-up (Baden-Fuller & Morgan, 2010). The configurational approach would rather target the former, while variables selected for developed theoretical types are empirically grounded based on their relevance.

2.3 Business models and configuration theory

Configuration theory scholars have investigated companies by differentiating between many factors such as strategies, structures, processes, and decision-making styles (Burns & Stalker 1961; Mintzberg, 1973; Miles & Snow, 1978). A company's business model can be argued to reflect its strategy (Shafer et al., 2005; Casadesus-Masanell & Ricart, 2010), and include its structure (Amit & Zott, 2001). Several scholars have also implied the relevance of an activity or process perspective in studying business models (Morris et al., 2005; Johnson et al., 2008; Zott & Amit, 2010). In addition, business models highlight a holistic and system-level approach in clarifying how companies operate their businesses (Zott et al., 2011). With a similar approach, configuration theory helps in explaining on a holistic system level how theoretical attributes fit with each other to achieve synergies (Miller, 1996). Configuration theory and business models hence consider similar factors and can therefore be argued to be a good match in terms of their theoretical constructs. This paper's conceptualization of business models as activity systems thus allows the adoption of content, structure and governance (Zott & Amit, 2010) as the three theoretical attributes at the core of the configurations.

Research on business models has highlighted the need to take contingency factors into account (Saebi & Foss, 2015; Pang et al., 2019), which is a fundamental part of configuration theory (Venkatraman, 1989). Although many different factors could be considered, this paper focuses on *digitalization* and company *location* as factors that will be discussed in more detail below.

2.3.1 Digitalization

Technology has been highlighted as a critical factor for business models (Pateli & Giaglis, 2005), and also for tourism (Stamboulis & Skayannis, 2003; Pantano & Corvello, 2014). It has been considered an important contingency factor in management studies for decades (Woodward, 1965). Technology explains how digitalization has introduced recent changes in various sectors, including tourism (Boksberger & Laesser, 2009; Laesser et al., 2009; Neuhofer et al., 2012; Koukopoulos & Styliaras, 2013; Kubiak, 2014; Wernz et al., 2014). This explanation can entail technology in the form of a product, product offering, or production development (George & Bock, 2011). Digitalization (Hull et al. 2007; Hair et al., 2012; Henfridsson et al., 2014; Tan & Morales-Arroyo, 2014), denotes the application of computer-

based technology. In this paper, we focus on how digital solutions either replace current ways of operating businesses, or create a basis for new businesses. This in turn stresses *the context of use* rather than the technology as such, as recently seen in the sharing economy, for instance (Belk, 2014).

Digital solutions may support regular businesses, enable seamless intermediaries between present companies, or create entirely new businesses (Hull et al. 2007; Hair et al., 2012; Guthrie, 2014; Sussan & Acs 2017). Dy et al. (2017) point at how digital solutions lower entry barriers to markets, create 'invisible' online markers, or serve to "disembody" the business by taking it online. Digitalization has traditionally affected marketing and sales (e-commerce, Guthrie, 2014; Hair et al., 2012), yet more recently has expanded to include organizing exchanges around platforms, which links increasingly more parties together and hence affects companies' abilities to develop and operate multi-party business models (Schweizer, 2005; Chesbrough, 2007; Zott & Amit, 2013).

In tourism, the advancement of tourists using mobile phones has led to big changes in how tourists behave (Neuhofer et al., 2012), transitioning from "sit and search" to "roam and receive" (Pihlström, 2008). Digitalization has provided consumers with sources of information, user-generated content, and various forms of platforms for interaction (Neuhofer et al., 2012). The online booking systems, e-tourism, and platform-based businesses as referenced by Beritelli and Schegg (2016), Forgacs and Dimanche (2016), Kathan et al. (2016), and Yu (2016), all depart from digitalization in the sector.

2.3.2 Destination location

For tourism businesses, it has traditionally been important to be positioned close to tourism destinations to be able to interact with customers, while offering products and services for tourists. Brush et al. (2008) use the location of businesses as a factor in their configuration framework, and highlight that location choice is of importance in terms of access to the firm and availability of specific physical, infrastructural, and human resources. As well, efficiency and aesthetic factors such as accessibility (Prideaux, 2000) and attractiveness (Henderson, 2006) have been pointed to as important in tourism research. Nicolau and Más (2006) highlight the importance of distance when tourists select a destination. This includes physical distance from home destination and how infrastructure makes the destination accessible by, for example, roads and airports (Prideaux 2000; Riera 2000). This again means that rather than placing itself close to the tourist's residence, it is important to offer accessible experiences. This gives location a specific meaning for tourism, where tourism firms should place themselves close to accessible and attractive destinations.

If a location is suitable in terms of distance and accessibility for tourism, it can of course still be an unattractive destination for tourists. An attractive destination means that the place itself creates the reason for tourists to travel there (Kim & Perdue, 2011). The availability of food and restaurant businesses, retail stores, golf courses, and cultural sites are some of the factors that make destinations attractive for tourists (Formica & Uysal, 2006). Nonetheless, recent trends in tourism point at how previously unattractive destinations have tended to become attractive based on unique services and experiences offered, that is, the location's market value proposition and business model.

For example, amusement parks can turn a previously unattractive destination into an attractive one. Also, some hotels offer an experience that makes the hotel itself a destination, while e-tourism tends to blur any link between suitability and attractiveness as the tourist no longer travels to the destinations, but experiences them from home (Yu, 2016). Both options mean that digitalization has had an impact on the tourism location. Furthermore, digitalization in the tourism industry may mean that tourist firms will operate from "somewhere else" than the destination itself, as is the case with various intermediary tourism services. Likewise, with sharing economy platforms, for instance, as denoted in the business model typology developed in this paper.

3. Research Design

To conceptually develop a business model typology in tourism, this paper departs from a "chronological" development that starts in terms of business models that have existed for a long time, then moves on to more recent developments of business models in the sector. The focus of this research is on the activities pursued by tourism sector actors (Zott & Amit, 2010), while also linking these with who performs the activities in single-party or multiple-party settings (Zott & Amit, 2013). We thus explore the main streams of development that have caused ongoing transformation of the sector, in

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particular, digitalization, new patterns of tourism, and the introduction of new players in the sector. We describe four possible business model configurations that customers are able to interact with that were identified in this process, and exemplify them below.

The four types of business models were analyzed in an iterative process (Bocken et al., 2014) through looking at the content, structure, and governance activities (Zott & Amit, 2010). This allowed us to identify distinct differences among the four typical business models, while permitting modifications to the initially identified business models. In further analysis of the business models, their fit among activities (Morris et al., 2005) was captured through carefully studying the synergies among activities based on practical examples of each type of business model to conclude the four ideal types.

4. Business Model Typologies in Tourism

By integrating the considerations of digitalization and location, we developed a typology framework of different context settings for business models (Figure 1). This typology serves as a starting point to understand the fit (Miller & Friesen, 1978). Fit for this typology is based on the fit between digitalization, the location of the destination, and the business model. Thus, different business models can be argued to fit well together depending on these two different factors, as elaborated below.

4.1 Bricks and mortar business model

Cell 1 is characterized by a suitable and attractive destination, when the tourist firm only modestly relies on digital solutions. The archetype for this setting is therefore the traditional bricks and mortar tourism business model, which depicts how various tourist firms locate themselves in attractive destinations, where the destinations themselves are the reason for tourists to travel there. This includes, for instance, the establishment of a hotel or restaurant in Paris or New York, two examples of destination cities. With this business model, it is thus key to be located close to or at an attractive destination, which brings the reinforcement of having proximity to supplementary establishments (for example, a restaurant being close to a hotel). The business model is based on suitable and attractive destinations (Prideaux, 2000; Henderson, 2006) and does not require digital capability.

Using Zott and Amit's (2010) operationalization of business models as activity systems, the content of the main activities of this type of business model can be seen as serving a classic tourism service (involving travel, accommodation and/or meals) to the tourist directly. The governance and linking of activities are all handled by a "focal" tourist firm (a single company such as the hotel owner or restaurant, whose focus is to manage the tourists' experience) and are predominantly done so through its choice of location. Finding fit between the activities, structures, and governance should be reasonably unproblematic, since it all falls within the

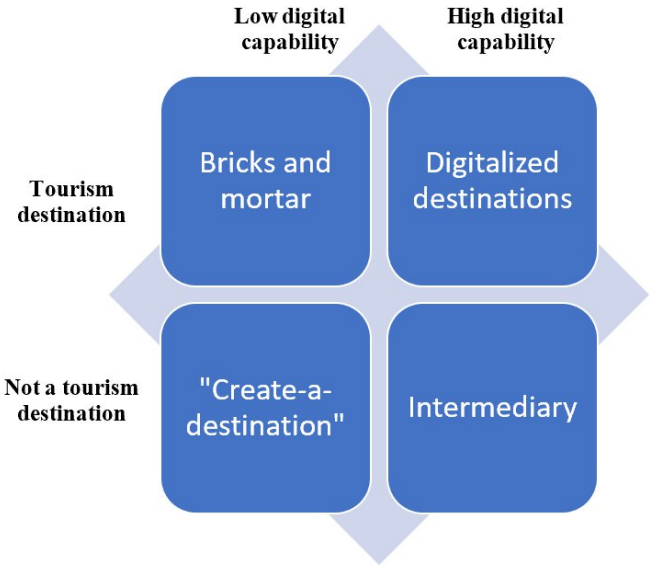

Figure 1. Tourism business models based on location and digitalization

same focal firm (given that individual tourist firms act quite independently of one another). Well performed, the fit should lead to efficiencies and synergies. The contingency factor of an attractive location will also lead to considerable synergies of the business model as tourists will be attracted to the location, while it would be considerably difficult to reach fit with this type of business model if the tourist firm were not located close to an attractive destination.

4.2 "Create-a-destination" business model

"Create-a-destination" (lower left cell in Figure 1) is characterized by a tourism destination, where the firm has low to medium digital capability. The archetype for this setting is a "create-a-destination" business model, which denotes how tourist firms explore areas that would not normally attract any tourists (Barreda et al., 2016). Rather than locating to an attractive destination, the tourist firm creates that destination and does so geographically in an area reachable for consumers (that is, suitable for tourism). All of this is an integrated part of the experience and *the destination would not attract tourists unless the tourist firm had been there*.

The ice hotel outside of Jukkasjärvi, Sweden, is one example of this. The hotel is constructed totally of ice and gets rebuilt with different designs every year. Activities integrated with the hotel visit include hot tub bathing and ice sculpting, for instance, along with the hotel itself as a tourist attraction. Other examples of experience-based business models are amusement parks (for example, Disneyland).

The content of the main activities of this type of business model (Zott & Amit, 2010) is the concept of an integrated service offering that constitutes an entire tourism experience. This refers to how hotels, restaurants, and tourist attractions built by different owners or business partners, co-located as a way to create an attractive shared destination, where the tourist consumes multiple elements as one offering. The tourism activities are thereby expanded to include a unique experience.

Compared to the bricks and mortar business model, the create-a-destination model requires more activities that are linked and structured by a focal firm, and (possibly) coordinated with local business partners (Chesbrough, 2007). Governance of these businesses can vary, but the core of the service would often be offered directly by the focal firm, while unique value proposition would require co-produced activities with, for example, artists, architects, and adventure experts. The location's contingency factor being suitability it is important to make it an attractive destination, as well as having a variety of suitable complementary actors co-locating to create attractive choices for the tourists.

4.3 Digitalized destinations business model

A digitalized destination business model (upper right cell in Figure 1) refers to a destination where the tourism firm has digital capability. The focus for the archetype in this setting is a business model that relies on highly advanced tourism experiences and includes technology *at the destination*, sometimes referred to as "smart tourism". This contains technology advancements that make use of such things as sensors, big data, near-real-time real-world data, visualization, and new ways of connectivity (Gretzel et al., 2015), including digitally-mediated tourism experiences, which are enhanced through context awareness and personalization (Buhalis & Amaranggana, 2015). The archetype for this model is not yet well established, but with the rapid digital development of tourism destinations, its transformation continues to be vital in the near future (Koukopoulos & Styliaras, 2013). Better informed, connected, and engaged tourists who can interact at the destination in new ways will provide new and enhanced tourism experiences.

The critical activities of this archetype (Zott & Amit, 2010) are focused on gathering data from users (big data or data from sensors), then analyzing and presenting it (visualization).They are also concerned with the creation of a seamless experience for the tourist (Hull et al. 2007; Hair et al. 2012; Guthrie 2014; Sussan & Acs 2017), including the connection of various digital systems with real life tourism experiences.

The structure of this type of business model requires that all activities be highly linked among various actors in a way that enables a seamless and user-friendly experience. Governance in this business model is expected to be highly distributed among different actors that specialize in a niche technology area (for example, collecting data through sensors may be performed by one firm, while analyzing the data may be performed by another firm, and how the data is used may not even be known by those providing it). The digital capability of a company with its combined physical and human resources is the vital contingency factor for this type of business model.

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4.4 Intermediary business model

The intermediary business model (lower right cell in Figure 1) means that the company does not have to be located where tourists travel, yet can still be involved in tourism activities. This type of business model can be described as a location that is not necessarily a tourism destination itself, and where the digital capability of the firm is high. This archetype includes P2P and online business models. The tourism firm here operates as an intermediary platform (Riemer et al., 2017) between the destination and the tourist.

Tourism platforms include online booking sites, which become more popular as tourists freely choose among alternatives and become their own travel agencies by directly selecting hotels, flights, and so on (de Carlos et al., 2016), and also P2P exchanges. Examples of booking sites include *Booking.com* and *TripAdvisor*, which act either as intermediaries between traditional tourist firms and tourists, or among tourists. The P2P setting (Belk, 2014) refers to how consumers appear as both producers and users in the business model, enabled through platform technology (Sigala, 2017).

This type of business model has introduced entirely new actors into tourism sectors as platform operators, intermediaries, and service providers. Its conceptualization has led established parties in the sector to adapt these business models (Geissinger et al., 2017). In addition to introducing new actors and thereby affecting competition in the tourism sector, P2P business models also modify current concepts and configurations. The lodging provided through *Airbnb* (Forgacs & Dimanche, 2016; Kathan et al., Veider 2016), for instance, includes how the tourist may interact with the accommodation's owners (Richard & Cleveland, 2016; Johnson & Neuhofer, 2017; Mao & Lyu, 2017). The typical example here is the sharing economy platform *Airbnb* (Wegmann & Jiao, 2017), but this type of business model includes many variants, such as *Vayable*, a platform for personal tour guides. The main activity of this type of business model is to link tourists with an offer that the tourist is willing to buy.

There are several critical activities associated with this type of business model: attracting service providers and users to a two-sided platform, the platform's role as an intermediary linking providers and users together, and providing a form a security (for example, through holding payments and collecting reviews; Ert et al., 2016). The structure of activities (Zott & Amit, 2010) needs to be linked with basically instant interaction (for example, tourists asking providers about availability through the platform, and then making an instant booking). The governance model is distributed so that the focal firm - the platform - connects and secures transactions, which enables the service providers to freely offer their services. The contingency factor is the digital capability of a company and the number of service providers and tourists needed to create an attractive and sustainable link between the offerings and their consumers (Chesbrough, 2007).

5. Discussion

Rather than aiming for a one-fit-all business model for tourism, the study follows a configurational approach and the notion of "equifinality" (Fiss, 2007, 2011), which implies that there are many different paths to the same business goal (for example, high performance). In line with this, the paper suggests that there are several different tourism business models.

The configurational approach to business models accentuates the importance of holistic context interactions (Porter & Siggelkow, 2008). Research on business models has been, in general, too often absent from contextualization. This paper argues that it is not only about matching business models with the tourism sector, but also about taking contextual factors into consideration. In this study, location and digitalization are highlighted as important contextual factors in the tourism sector for the development of business models. The increased digitalization of businesses, including the introduction and growth of the sector's sharing economy, points at the dynamics of such contextual factors, and the need for firms to adapt to ever new circumstances, as well as to redefine location. By combining several factors of business model activities with the contextual factors of location and digitalization, knowledge about business models can be enhanced compared to researching these factors in isolation or describing business models generally.

The various business model archetypes indicate how activities are performed by multiple independent (for example, the bricks and mortar business model) or highly integrated tourist firms (for example, the create-a-destination business model). Digitalization is linked in business models to the introduction of new actors, including intermediary business models, and the construction of destination interactions, such as smart tourism. New actors combined with business network integration put focus on the importance of business

partnering and shared stewardship of resources.

In comparing intermediary business models with create-a-destination business models, for instance, the create-a-destination model requires coordination among tourist firms, while in intermediary business models, coordination is only accomplished by the intermediary firm itself, mediated by digital solutions. Thus, the density of interactions is more limited, while the number of actors is higher, and trust is also given a different meaning as it is not based on social interactions, but rather on digitally coordinated experiences (Möhlmann, 2015), including travel advice and evaluations shared among peers.

Local presence and type of business vary across different business models. Bricks-and-mortar and create-a-destination business models need local presence to function, while in intermediary business models, the focal firm does not (necessarily) have to have a local presence. A digital destination is either based on a local destination presence, or on firms operating remotely to the tourism destination. The extreme here is e-tourism with "tourists" not even visiting the tourism destination. Intermediary business models can be seen as enablers for other businesses that accentuates the role of intermediaries, while the other business models provide core values for the tourist. Therefore, it is important to note that these different archetypes of business models may well coexist and even mutually assist one another. The archetypes should therefore be seen as typical, rather than as exhaustive or non-combinable. Attractive destinations (such as a city) can be one important factor, but the experience of a unique hotel in an attractive destination can add to the whole experience, thereby becoming a hybrid configuration.

6. Conclusions

Based on a configurational approach (Meyer et al., 1993; Miller, 1996), we created a theoretically derived typology of tourism business models, which includes four different archetypes. The archetypes are each connected with different contextual settings: (1) bricks-and-mortar business models, where single actors perform distinct and separate activities linked to attractive destinations, (2) create-a-destination business models, which include making an unattractive destination attractive, (3) digitalized business models, which use devices to enhance experiences and provide e-tourism and smart tourism, for instance, and (4) intermediary business models that put focus on digital solutions to connect tourists with current and new actors and tourism destinations.

The paper highlights the impact of contextual factors, in terms of suitable and unsuitable locations (Prideaux, 2000), as well as attractive and unattractive destination locations (Kim & Perdue, 2011). Moreover, we incorporated the influence of digitalization as a trend currently disrupting tourism in the typology (Stamboulis & Skayannis, 2003). The four business models follow - but are also part of creating - transformational trends in the tourism sector, which includes new parties entering the tourism sector (for example, intermediaries and peers), digitalization (enabler for online and P2P operations), and new consumption patterns (focusing both on more active tourists and how tourists arrange their travelling more independently through sites and apps) (Boksberger & Laesser, 2009; Laesser et al., 2009; Koukopoulos & Styliaras, 2013; Kubiak, 2014; Wernz et al., 2014). Importantly though, the different business models continue to exist side-by-side, while research increasingly has turned its focus to, for instance, sharing economy business models as entering and transforming the tourism sector (Gutierrez et al., 2017). Tourism business models may well complement one another locally or at a distance, and thereby be integrated or create value-added interactions among parties.

6.1 Theoretical contribution

The main theoretical contribution of this paper is identifying a typology for tourism business models. Previous researchers have described various business models and ways to operate businesses in the sector, as well as marked the importance of understanding business models in the sector (Brannon & Wiklund, 2014). We believe this paper might be the first to actually present a typology.

The uniqueness of the tourism sector, with location as a main business characteristic, together with its rapid digitalization, means that this typology is sector-specific, while also contemporary. With theoretical grounding in a configuration approach, it takes the two factors of location and digitalization in the tourism sector into account, thereby deriving a new way of classifying tourism business models. The four business models highlighted that there is a wide diversity of tourism firms, and the classification enables future tourism research to be conducted in new ways. Moreover, the paper takes a fresh approach to the theoretical grounding of business models by basing them on a

configurational approach. This contribution goes beyond the tourism sector and can be used for research on business models in other sectors or industries, perhaps through modifying the dimension of location to other factors central for the specific sector or industry.

6.2 Managerial implications

For managers, location and digitalization as outlined in Figure 1 point out how certain combinations are more fruitful than others, and how a firm may create an attractive location as long as it is suitable for tourism. For a tourist firm, the business model typology hence becomes a tool to consider alternative options, while also considering (present and upcoming) competitors' business models. Specific questions to address are: How suitable and/or attractive is the destination for tourism? What is needed to increase the attractiveness of the destination? How can this be accomplished by the firm and/or collaboration partners? What capabilities are needed to make it more attractive? How might digital solutions affect the business model? And what about the competition? It is also important that business model configuration does not get "stuck in the middle" between different archetypes (Porter, 1980), or fail to support the key activities to be performed. This means to draw attention to the contingency factors of attractiveness, location, and digital capabilities as noted in relation to each business model above.

6.3 Further research

This paper is conceptual, and therefore future empirical studies can investigate the occurrence of these business models in the tourism sector by surveying the sector. Detailed empirical studies, which investigate the forces that move business models toward or away from fit would also enhance our understanding of business models in the tourism sector.

A weakness of configuration theory is its general inability to establish temporal stability. Therefore, a further research idea would be to investigate the dynamics of tourism business models following from changes in context over time, and thereby exploring the potential need for modifications of the business model to maintain fit (business modelling). Also, foresight studies may be applied to capture actors in the sector and their thoughts about the future, and thus open interesting new paths for future research.

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Internationalization and Digitalization: Applying digital technologies to the internationalization process of small and medium-sized enterprises

Annaële Hervé, Christophe Schmitt and Rico Baldegger

"The biggest part of our digital transformation is changing the way we think."

Simeon Preston
Managing Director & COO
FWD Insurance

Digitalization is playing an increasingly important role in the growth of firms and is leading to structural and strategic transformations. The use of digital technologies presents new opportunities for SMEs to expand and succeed in foreign markets. The purpose of this paper is to investigate how the impact of digital technologies on the internationalization process of SMEs has been acknowledged in the literature. It offers an in-depth analysis of five of the most highly relevant recent scientific research papers. The findings are synthetized through key points that highlight how SMEs acting in foreign markets could benefit from digital technologies. This paper complements previous research on the international trade transition initiated by digital technologies and provides a new perspective on contemporary research regarding the internationalization of firms. It concludes by identifying implications for research by scholars seeking to further study the digital aspects of traditional theoretical models of internationalization.

Introduction

Businesses and societies are undergoing a process with multiple transformations. Both are operating within broader complex economic systems. Businesses themselves therefore must understand, in concrete terms, the many elements of dynamic interaction involved (Morua et al., 2015).

With the advent of digital technologies, a new social paradigm is emerging, and disruptive changes are an important part of future progress. Characterized by the convergence of many emerging technologies, whose core is data (big data, artificial intelligence, internet of things, etc.), digitalization leads firms to radical transformations in their systems and processes, as well as in their management methods and workforce. For instance, by reducing operating costs and improving interactions among ecosystem stakeholders - including customers, partners, suppliers and distributors - nascent digital technologies are playing an increasingly important role in company growth (Nambisan, 2017; Reuber & Fischer, 2011, 2014).

Digitalization has started to be addressed at a scientific level in the fields of entrepreneurship and management research, among others (Kraus et al., 2019). However, although international research has been fundamentally influenced by the pervasive effects of technological advances for many years, relatively few studies have investigated emergent digital technologies to theoretically understand and empirically test their attributes in international business management (Hannibal & Knight, 2018; Brouthers et al., 2018, 2016; Neubert, 2018; Ojala et al., 2018; Stallkamp & Schotter, 2018; Watson et al., 2018; Wittkop et al., 2018; Coviello et al., 2017; Strange & Zucchella, 2017; Autio & Zander, 2016; Tanev et al., 2015).

Our research builds upon the recent Hervé et al. (2020) paper, aiming to study the effects of digital technologies on the internationalization processes of small and medium-sized enterprises (SMEs). To this end, the research performs an in-depth analysis of five relevant scientific papers. By using insights and arguments from

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the literature of international business (IB) and international entrepreneurship (IE), we identified four main fields of activities that are at the center of interest for entrepreneurs when acting in international businesses: cost, accessibility, resources and competences; market knowledge; distance and location; relational competences and partner networks. The purpose of our study is to provide a synthesis of the key insights articulated in the five papers and highlight the main impact of digital technologies on these four fields of activities. It aims to contribute to IB and IE research by offering a better understanding of how the use of digital technologies can lead to new entrepreneurial opportunities in foreign markets. This objective is grounded in the current need to contribute to the development of new theoretical foundations for empirical research on internationalization on the interface of IB and entrepreneurship (Keupp & Gassmann, 2009).

By integrating new digital technologies into the value chain and managing a massive amount of data, firms are likely to seize new opportunities with innovative ways to reach potential customers and be instantaneously active on a global scale. In general, digitalization impacts internationalization processes of firms in terms of accessibility of resources, skills, and competence acquisition, as well as in terms of the potential for learning and knowledge-development in foreign markets (Coviello et al., 2017). Other parameters, like location and entry mode choices or time and expansion rate, are also influenced by digital technology usage.

However, in the literature, internationalization theories and models have not been adequately adapted to the possibilities and challenges provided by digital environments. This has been observed mainly through Johanson and Vahlne's (1977) stage model theory, which emphasizes a progressive engagement at the international level, while borders are now becoming more "dematerialized" (Stallkamp & Schotter, 2018). By questioning this stream of thought, scientific debates about the potential impact of the digital context emerge and constitute the starting point of this research (Kriz & Welch, 2018; Coviello et al., 2017). Based on theoretical insights from IB, IE and literature from digital entrepreneurship and information systems, the paper makes a contribution by providing a synthesis that outlines how digital technologies impact the internationalization process of SMEs. To conclude, we discuss the results and highlight suggestions for future research. The paper also responds to recent calls for more research on the phenomenological field of IB in digital contexts (Coviello et al., 2017).

Literature Review

Internationalization of firms

The internationalization of firms is a subject of interest for numerous scientific communities and has been addressed for several years. Over time, IB theories have suggested different internationalization approaches, that have been aimed mainly at large companies. The stage model approach considers internationalization as a linear and sequential process (Johanson & Vahlne, 1977). According to this model, a firm's knowledge is acquired gradually over time through experience, which is the most crucial resource needed in foreign markets. The authors of the related Uppsala model consider market knowledge (general and experiential) combined with the commitment of resources, as factors influencing engagement decisions and ongoing business activities in foreign markets (Johanson & Vahlne, 1977).

Although various IB theories have coexisted in the literature for several decades, the stage model has been often criticized and the scientific community has gradually relativized its universality (Knight & Liesch, 2016; Welch et al., 2016; Welch & Paavilainen Mäntymäki, 2014; Forsgren & Hagström, 2007; Andersen, 1993; Sullivan & Bauerschmidt, 1990). In response to taking a sequential approach, numerous authors have studied alternative internationalization paths (McAuley, 2010; Ruzzier et al., 2006; Nummela et al., 2006; Lu & Beamish, 2001; Gankema et al., 2000; Coviello & McAuley, 1999; Oviatt & McDougall, 1995). The increasing emergence and growth of entrepreneurial firms aiming at rapid internationalization enabled the development of new perspectives on internationalization models that were more relevant for SMEs.

The emphasis on SMEs firms in scientific research clearly demonstrates their decisive role in global industries. This has given rise to a new current of research developed at the intersection of IB and entrepreneurship theories, now called IE. This research field specifically studies small and young firms that venture abroad from their inception or soon after their launch (Reuber et al., 2018; Autio, 2017; Knight & Liesch, 2016; Jones et al., 2011; Baldegger & Schueffel, 2009; Keupp & Gassmann, 2009; Oviatt & McDougall, 2005;

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Rialp et al., 2005; Zahra & George, 2002; Oviatt & McDougall, 1994). Even if multinationals and small companies have a very similar process for managing their international activities (Oviatt & McDougall, 1995), the impact of globalization on SMEs is particularly strong and even more significant than on large companies (Ruzzier et al., 2006). Furthermore, being more comfortable with technology and more reactive to innovations, small firms can be actively engaged in business outside of domestic markets, and thereby benefit from global trade despite having limited initial resources (Knight & Liesch, 2016).

As these firms discover ways to quickly achieve their international objectives, the IE approach is better adapted than the traditional IB theories. However, although this emerging discipline has grown exponentially, the theoretical foundations of IE remain somewhat fragmented, and too generalized (Jones et al., 2011; Keupp & Gassmann, 2009). Especially due to the lack of a common conceptual framework, IE scientific research has been dominated by concepts that emerge from mainstream IB theories (Keupp & Gassmann, 2009).

Digitalization in firms

To explain the emergence of digital technologies, our research applied the insights of Autio (2017), along with Bell and Loane (2010). The first wave started in the early 2000s with the emergence of Web 2.0 technologies. The introduction of mobile operating systems (iPhone and Android), storage solutions on computer servers (cloud computing), learning algorithms, and big data technologies marked the next significant developments. Data feeds all of these technologies. Its collection and analysis have thus become more accessible for the development of user-centric and knowledge-driven products and services. Digital technologies, such as artificial intelligence, can now be applied to optimize production and distribution, to improve managerial decisions for market entry, to target new customers more effectively, to select relevant partners, to supplement advertising strategies, to take better pricing decisions and to make demand predictions (Kraus et al., 2019; Aagaard et al., 2019; Watson et al., 2018). 3-D printers also represent a crucial advance in manufacturing techniques and allow companies to revolutionize their production and better customize each product to meet the end users' needs. Another major technological advance is the Internet of Things (IoT). This consists of integrating sensors able to collect and process data into smart products and devices, which can thus communicate and interact with each other (Rüßmann et al., 2015). Finally, firms perceive new opportunities with blockchain technology, which has been defined as, "an open, distributed ledger that records transactions between two parties efficiently and in a verifiable and permanent way" (Iansiti & Lakhani, 2017). Distributed ledger (aka "blockchain") technologies provide firms with storage and transmission of information that is transparent, secure and which operates without third parties based on code.

Thanks to these recent technological advances, powerful information processing and storage resources are now widely available. The widespread adoption of these constituent technologies creates an enabling business environment. On one hand, it enriches interactions between individuals and, on the other, opens opportunities to improve value creation. To recognize opportunities and take advantage of these available tools, companies are faced with a transformation across their entire organization and activities (Kraus et al., 2019; Matt et al., 2015; Porter & Heppelmann, 2015; Bharadwaj et al., 2013). Moreover, because digital technologies support companies at different levels, whether for creating, producing, selling and marketing, delivering, or supporting, they also involve disruptive changes in the value chain (Porter & Heppelmann, 2015).

Ross and colleagues (2017) distinguished two steps in the transformation; become digitized and become digital. The first step takes place at the operational level and involves standardizing business processes and optimizing operations by implementing technologies and software. The second step involves purely digital technologies to articulate, target, and personalize alternative offers in order to define a new value proposition. It is, therefore, by taking the opportunity to redefine its business model and activities that a company becomes digital (Aagaard et al., 2019; Kraus et al., 2019; Ross et al., 2017).

Digital internationalization

Since the late 1990s, online sales turned to a new internationalization model. By dematerializing borders and reducing costs, e-commerce fundamentally changed the way business was conducted (Tiessen et al., 2001). Exporting to foreign markets through online sales became a significant competitive strategy. is particularly true for SMEs (Gabrielsson & Gabrielsson, 2011).

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Table 1. International Trade under Globalization

20th century globalization	21st century globalization
Physical goods, capital, and labor-intensive flows	Data, information and knowledge flows
Exchanges of mainly monetized transactions	Greater exchanges of free content and services
Mostly between advanced economies and multinational companies	More participation of emerging economies, SMEs, and individuals
Need for transportation infrastructure	Need for digital infrastructure
Slow diffusion of information across borders	Instant global diffusion and access of information
Innovation capacity and flows from advanced to emerging economies	Innovation capacity and flows in both directions

Source: modified from Manyika et al., 2016

Often faced with a lack of resources, the internationalization path has increased SMEs' agility in targeting markets and expanding their network (Watson et al., 2018; Mathews et al., 2016; Bell & Loane, 2010; Foscht et al., 2006). A study by Coviello and colleagues (2017) recognised that nascent digital technologies have democratised global consumption, paved the way to a wide database for knowledge acquisition in foreign markets, improved communication and information exchange, and facilitated cross-border transactions by increasing intangible flows and reducing location dependencies. These technologies will lead firms to base their production decisions more on proximity to customers than on production costs (Hannibal & Knight, 2018; Strange & Zucchella, 2017)

Methodology

Data collection

This review comprehensively presents the relevant literature and synthesizes the key insights on how digital technologies impact the internationalization process of established SMEs. Little previous research has focused on the integration of purely digital technologies into the internationalization process of established small firms. Therefore, due to an insufficient and highly fragmented research basis, a systematic approach could not be pursued. The limited number of articles corresponding to our criteria led the data collection towards a rather systematically performed traditional review.

The literature search was bound by specific factors. First, an articles search was performed with SAGE Journals, Google Scholar and Ulysses search engines, and came mainly from scholarly publishers, like Emerald, Springer, and Elsevier. Given the novelty of the subject, it was not possible to limit our research to peer-reviewed articles. We have thus expanded our investigations to include conference papers. We started the search with two main terms, "internationalization" and "digitalization", which, however, did not yield sufficient results to allow further investigation. Therefore, the study broadly expanded the targeted research on themes and keywords: "internationalization theory", "international entrepreneurship", "digital internationalization", "digital technologies", "digital entrepreneurship", and "digital transformation". The search was limited to English papers in the period 2016-2018. Finally, we considered only articles that used the term "digitalization" in the sense of applying purely digital technologies.

Data analysis

Once the relevant articles were identified, we conducted an in-depth analysis and comparison of the articles. After completing the analysis, five suitable papers that offered more systematic reviews and incorporated most of the points found in other articles were selected. The

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novelty of the field could explain the lack of systematic studies. Thus, our choice of these five articles allowed us to adopt a more systematic approach to the synthesis of the key insights. In addition, we observed that the five studies complement each other in terms of specific insights.

Each of the studies was analyzed based on the title, publication period, theoretical framework used, and key findings (Table 2). All studies were first reviewed at an aggregate level to determine general directions. Although the perspective of analysis differs greatly from one study to another, the synthesis we present here is designed through four selected fields of activities related to the main internationalizing criteria. These are: costs, accessibility, resources and competences; market knowledge; distance and localization; and relational competences and partner networks.

Results

Costs, accessibility, resources and competences

Coviello et al. (2017) and Brouthers et al. (2018, 2016) agree that digitalization has a positive impact and helps companies in managing the risks associated with potential additional costs from their operations abroad (liabilities of foreignness). In their arguments, these authors suggested that technological advances also dematerialized distribution and production channels. These circumstances allow companies to specifically decrease transaction costs in foreign markets. For example, the use of IoT will result in changes in the management of geographically dispersed value chains and thus allow firms to reduce costs related to their international production (Strange & Zucchella, 2017). Furthermore, by exploiting digital tools, Autio and Zander (2016) argue that internationally active small firms can significantly reduce the amount of assets needed for operations, as well as cost of location specificity. Because commercial activities are managed remotely, SMEs operating digitally in international markets appear to be able to generate alternative revenues without making significant investments. Resource allocation in several markets, transaction time-savings, and more optimized decision-making processes are additional effects of digitalization.

At an international level, SMEs need to maintain a specific advantage that differentiates them from local competition. To achieve this, they can aim to maximize their entry-mode attractiveness by targeting a niche market and offering innovative high-quality products. Another way is to collaborate with specific local distributors that are already integrated in a large network. By reducing operating costs and improving communication and interaction with all ecosystem stakeholders - including customers, partners, suppliers, and distributors - digital technologies present new opportunities in terms of skill sharing, open innovation, co-creation, and partnership between companies (Coviello et al., 2017).

Market knowledge

Stage model theories have emphasized that a firm's speed of internationalization depends heavily on its ability to acquire new knowledge about foreign markets. One of the most significant changes related to the acceleration of online exchanges is the ability to capture and disseminate a considerable amount of data (Neubert, 2018). As it is now possible to directly interact with customers, companies can better understand customer needs and personalize their services and offers. Furthermore, by enhancing machine-to-machine and machine-to-human interaction, IoT facilitates product customization. In addition, 3-D printers provide customers with greater influence over the design of their products and over the control of manufacturing origins (Strange & Zucchella, 2017). Thanks to these technologies, firms will better meet end-user requirements. Digitalization in such ways provides new fundamental experiential knowledge to companies.

Autio and Zander (2016) suggested that by combining the theoretical principles of *Lean Entrepreneurship* with the use of digital technologies, like big data and analytics, companies can conduct market experiments faster and in more countries. This allows firms to test products and services directly on potential customers in advance, no matter their location in the world (Strange & Zucchella, 2017). Thanks to these experiments and the market knowledge gained from them, companies have learned how to perform better and benefit from direct contact with consumers by better adapting and customizing their offers (Strange & Zucchella, 2017). Thus, they can frequently introduce advanced versions of their products and services (Strange & Zucchella, 2017; Brouthers et al., 2018, 2016). To improve their position abroad, companies use feedback and comments shared on user community platforms or social networks. These online apps are flourishing with the advent of digital technologies. For that reason, idea sharing is fundamental for market adaptation, as it allows companies to anticipate their marketing efforts, and deploy better-targeted marketing and prospecting

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activities (Brouthers et al., 2018, 2016). By communicating with user communities, SMEs become more responsive to implementing the necessary measures and, consequently, optimizing speed and marketing gains.

Emerging digital technologies are based mainly on the accessibility of internal and external data (Neubert, 2018). The collection of this abundant data (for social or commercial networks, or intellectual market knowledge) is a valuable source of information for companies and reduces cross-border information asymmetry (Autio & Zander, 2016). The data can be processed by predictive algorithms to assess a company's current conditions and future market attractiveness (Neubert, 2018). The decision-making process is also supported by more advanced data-mining techniques, such as machine learning. Based on artificial intelligence and statistical approaches, this technology helps firms to model and interpret collected data for strategic purposes. Market knowledge with deployment of user communities, data collection, and new sources of accessible information underline the market-based approach of most SMEs.

Distance and location

The digitalization effects on distance and location are manifested mainly by border dematerialization and the acceleration of internationalization operations. Not only can a company manage its international activities online, reduce psychological distances, and multiply targeted countries, but the activities will also be led by business networks and user communities. Nascent digital technologies are transforming the location and organization of manufacturing production worldwide and will encourage firms to favor decisions based on proximity with customers rather than production costs (Strange & Zucchella, 2017). In their research, Autio and Zander (2016) affirm that digitalization offers greater transferability of firm-specific assets. It allows small, internationally active firms to benefit from reduced dependence on location-bound assets in home and host countries (Coviello et al., 2017).

SMEs are often strongly advised to use rapid access to international trade promoted by digitalization. These pioneer leading firms create new opportunities to manage their activities from a distance and thereby reach a larger number of markets with the same productive resources by, for example, externalizing location-specific assets. Another aspect linked to distance and location was raised by Brouthers and colleagues (2018, 2016). They argued that when entering a foreign market, SMEs are confronted with new internationalization obstacles called "liabilities of outsidership". This concept suggests that when a firm reaches a new market, it usually has few relations with other firms, and is consequently considered an outsider. Firms applying nascent digital technologies can counter this liability by generating value through the creation and coordination of a network of users via the construction and management of digital platforms.

However, although a platform is easily replicable from one country to another, transferring the user bases is more difficult. Therefore, small firms are forced to quickly reach a critical mass of users to establish themselves in foreign markets (Brouthers et al., 2018, 2016). A limited number of users does not encourage further interactions and makes market entry harder. And in most cases, because platform costs exceed expected profits, the expansion rate can be significantly slowed down. To counter this, companies need to succeed in attracting potential users to adopt and populate their platform, and rapidly develop a large community of users (Brouthers et al., 2018, 2016).

Relational competences and partner networks

Markets are mainly relationship networks that firms maintain with their distributors, suppliers and customers. Over time, internationalization theories have emphasized the importance of building and integrating networks on a global scale. However, the digital context challenges the very foundations of network theory, such that it is now necessary to fundamentally rethink our actual understanding of relationships across international trade (Autio and Zander, 2016).

First, there are a growing number of market participants acting on both sides, as sellers and as buyers (Coviello et al. 2017). This allows SMEs to integrate customers into their ecosystem and develop direct contact with them. More precisely, Strange and Zucchella (2017) argued that firms can now involve customers *as providers of key information and feedback on products, and even as local manufacturers*. These authors pointed out that the relationship between firms and customers changes dramatically and gets redefined in many ways. Second, markets are current, momentaneous and dedicated to specific transactions (Coviello et al., 2017). This makes it more difficult to conclude long-term relationships with actors integrated at the time into any network in question. Because digital technologies are increasing the number of instantaneous, brief and interrelated

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interactions, the pace of these encounters is also accelerated. It thus allows firms to speed up their market adaptation to reach several new foreign markets at the same time (Coviello et al., 2017). Finally, the intensified used of the Internet has initiated and amplified the creation of one large virtual global "market" for trade involving economic and social transactions, as well as exchanges of tangible and intangible goods (Coviello et al., 2017). This development has led to a broadening market scope, and also afforded better access to local market actors and partners.

Thanks to the wide flow of data, SMEs are now often more oriented towards exchanges than production (Coviello et al., 2017). And these exchanges seem to provide new opportunities for international trade. Indeed, companies have increased access to local knowledge and simultaneously can enhance the reliability of their main relationships. By sharing data and skills with partners, SMEs have new possibilities for integrating targeted networks. To maintain these exchanges, decision-makers are recommended to set up processes and mechanisms to arrange relationships developed with a diversified and dispersed set of actors, both internally and externally (Coviello et al., 2017). Small firms likewise should aim to multiply user communities in several countries, while making sustained use of social networks and mass media deployed there (Brouthers et al., 2018, 2016). In their research, Brouthers and colleagues (2018, 2016) also suggested collaborating with opinion leaders and change agents in foreign markets. These well-known actors and public figures can serve as powerful levers in social media and user communities around the world. They can help a company become known quickly and build its online reputation, resulting in small firms internationalizing faster.

Discussion

This paper combines two research streams to understand their links and relationships. Through our observations, we first noticed a lack of congruence in internationalization research between existing models and the actual environments in which SMEs operate. Then, by taking into consideration scientific research focused on digitalization, we found that there are many untapped entrepreneurial opportunities for firms to undertake successful international trade. These findings corroborated the need to address the digital issue on traditional internationalization theories and allowed us to highlight the main effects of digital technologies on the activities of small firms abroad. Through the results shown in Table 3, we clarified how SMEs can use digital technologies to achieve successful international activities.

International trades are transforming and dematerializing the rate of digitalization. Our results highlighted the dynamic of a current, international environment constantly in movement. SMEs are immediately connected on a global scale without necessarily requiring specific resources or business networks. Here are some of their impacts:

- they are threatening large companies by sharing their skills via large groups of entrepreneurs;

- transaction costs are significantly reduced;

- communication, distribution, and production channels are dematerialized;

- markets are virtual, instantaneous, and more competitive;

- physical flows are giving way to data flows;

- geographical distances are virtually reduced and allow partner networks to largely dominate trade negotiations between nations;

- seller and buyer meet directly, regardless of distance or time zones;

- consumers are directly integrated into development and internationalization processes; and,

- the emergence of user communities and social media enables firms to test and adapt offers to local markets and, in some cases, to diversify activities.

Digitalization has removed many international barriers and allows larger SMEs to engage in international markets and act like micro-multinationals. Nevertheless, the impact of fundamental uncertainty (Kraus et al., 2019; Ojala et al., 2018) and the need to take into account non-linearity and interdependencies in the internationalization process, increase complexities for

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entrepreneurs, and have a direct impact on the entrepreneurial competences needed in foreign markets. Thanks to our research, we noticed that entrepreneurs and managers are widely encouraged to effectively integrate their organizational capacities and skills, strategically position themselves as market participants, and actively drive their own ongoing digital transformation.

Nowadays, the use of technologies impacts firms by enabling a transformation of not only their operations, offerings and value propositions, but also by enhancing their interactions with customers. Furthermore, it supports the firms' numerous organizational and strategic aspects and allows them to overcome several internal barriers. For instance, at a strategic level, nascent digital technologies affect the configuration and coordination of the entire value chain. They can create essential networks and sources of data that aid and allow firms to directly find investors, recruit talent, and solicit opinion leaders or change agents. Our findings show that digitalizing business functions could involve redesigning a firm's business model in a way that enables new opportunities for internationalizing, creating value, and developing customer relationships. For instance, digitalization facilitates a "servitization" transition in some companies, which means adding different services to complement an earlier product offer, and, thus, adds support for the customer in a broader way (Aagaard et al., 2019).

There are essential factors involved when defining the international scalability of an SME's business model. A B2C-oriented business model designed to reach critical mass that combines with user engagement and a collaborative approach is one of these essential factors. Digitalization will also change the production, transportation, and logistics patterns. In their research, Hannibal and Knight (2018) mentioned the "de-globalized" production and other strategic opportunities with regard to diversification. For example, the use of 3D-printers will allow firms to base their production site closer to consumers and, in this way, favor customization and reduction of transportation and logistics costs. Based on these results, our research calls into question the "international" dimension of international trade. Instantaneous access to foreign markets is a reality and, as shown in our results, a greater role to be played by nascent digital technologies is just beginning to happen.

Conclusion and Agenda for Future Research

In the light of increasing digitalization, our paper contributes to the literature by providing a new perspective on contemporary research involving internationalizing companies. It presented an in-depth analysis of five scientific research papers and aimed at understanding international trades in transition as initiated by global digital technologies. From a managerial point of view, our study addressed digitalization issues involved at the firm's structural and strategic level. Linked with standard internationalization criteria, key points identified in our research (Table 3) show how managers acting in foreign markets could benefit from digital technologies.

We are convinced that the convergence of globalization and digitalization clearly demonstrates the need for business leaders and decision-makers to reassess their strategies. As we are still early in the digital era, significant opportunities remain to be seen. However, most managers currently have little theoretical knowledge of digitalization history or trends. Managers may benefit from the use of digital tools in several ways if they can rapidly master and integrate them into their internationalization process. The faster a company understands the benefits of using digital technologies, the faster it can improve its decision-making processes and accelerate its internationalization speed (Neubert, 2018).

In these circumstances, future research should focus on using quantitative and qualitative data to empirically study the effects of digitalization on internationalization processes. Such data would be valuable to help define how the use of digital technologies affects internationalization models and strategies. In the literature, the risks of digitalization in international trade are not empirically addressed. Although the research we conducted agreed that the use of digital tools has a positive effect on international expansion, the limits of digitalization could be an avenue for future research. Indeed, risks related to digital internationalization, like the increase of price pressures, intensification of aggressive global competitiveness, cybercrime, and the lack of global legal protections, are some examples of topics still largely unexplored. Concerning legal protection, new institutional arrangements and standards will emerge to regulate the growing interconnectivity and complexity generated by

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digital environment, and companies will likewise face new entry barriers and regulatory compliances imposed by governments.

Another interesting research orientation related to digital internationalization is the context of emerging economies. Because the world is more interconnected than ever, scientific research related to internationalization theories should pay more attention to emerging countries, where a multitude of niche markets are rapidly flourishing thanks largely to digitalization, and its "leapfrog" potential. It is the first time in history that emerging markets have become counterparts in more than half of global trade flows, while South-South trade between nations is the fastest-growing type of connection (Manyika et al., 2016). In view of the above, research into internationalization has, therefore, many unexplored avenues of study open and available regarding digital transformation. Researchers should focus on empirical data collection and adapt their approach to realities on the ground (Delios, 2017). Future research on digitalization needs to build new theoretical models better adjusted to the current international trade environment than the frameworks commonly found in the literature.

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Appendix - Table 2. Overview of selected papers used in the synthesis

Authors (year)	Title	Scientific review	Research objective	Theoretical framework	Key results
Autio and Zander (2016)	Lean international-ization	*Academy of Management Proceedings*	This research explores how digitalization impacts expansion processes of INVs. By focusing on their business operations, authors explain how the use of digital tools affects international trade.	*Transaction cost theory* *Foreign entry mode* *International Entrepreneurship*	Through several proposals, the researchers present the main effects of digitalization on the INV internationalization process. Their proposals suggest that digitalization mainly reduces geographical distances, the specificity of vertical and horizontal assets, and cross-border information asymmetries. By linking lean entrepreneurship practices to digitalization, the authors formulate a new theoretical lens: *Lean Internationalization.*
Coviello and al. (2017)	Adapting the Uppsala model to a modern world: Macro-context and micro-foundations	*Journal of International Business Studies*	This study is a counterpoint to the last Uppsala Model version (2017). It examines two missing dimensions to the model: the impact of the digital context at a macroeconomic level and the role of decision-makers at a microeconomic level.	*International Business* *Entrepreneurship* *International Entrepreneurship*	Research results underpin the importance of studying the digital context at a macroeconomic level to create and exploit new opportunities in foreign markets. Based on the Uppsala model, the authors develop a three-level conceptual framework. This model integrates the macro and micro characteristics studied in their counterpoint.
Strange and Zucchella (2017)	Industry 4.0, Global Value Chains and International Business	*Multinational Business Review*	Based on the main digital technologies (IoT, big data and analytics, robotic systems, and 3D-printers), this research aims to assess how their adoption impacts the location and organization of activities in global value chains.	*Industry 4.0* *International Business*	The authors report the way in which digital technologies are disrupting how and where activities are located and organized within global value chains as well as who captures the value added within those chains. Through real facts, their research explains the concrete effects of digital technologies on the practice and theory of international business.
Brouthers et al. (2018, 2016)	Explaining the international-isation of business firms	*Journal of International Business Studies*	The authors extend internationalization theories to digital firms. Based on a literature review and case studies, they examine and compare the internationalization process of such firms.	*International Business* *Social network theory* *Diffusion of innovation theory*	Thanks to the use of platforms, the authors suggest that digital firms are less impacted by the liabilities of foreignness. On the other hand, these digital companies might suffer from a lack of relationship with existing networks and be faced with more difficulties in developing potential collaboration across foreign markets (liabilities of outsidership). Based on a multi-case study, their research develops a new theory and testable hypotheses.
Neubert (2018)	The impact of digitalization on the speed of internationaliz ation of lean global startups	*Technology Innovation Management Review*	This research aims to demonstrate how the use of digital technologies in the expansion process accelerates the internationalization rate of Lean Global Start-ups.	*Lean Global Startup* *International market development processes*	Results confirm a significant and positive impact of digitalization on the start-up internationalization process. The authors suggest that the integration of digital technologies allows companies to deploy new knowledge, to rapidly integrate relational network, to improve the efficiency of decision-making processes and, finally, to accelerate the speed of internationalization.

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Appendix - Table 3. Digital effects and opportunities for international trades

	Digitalization effects on internationalization activities	Opportunities for defining new value propositions through digital use
Costs, accessibility, resources, and competences	• dematerialization of distribution and production channels • reduction of assets and location specificity • improvement of interaction and exchanges • reduction of additional cost for foreign operations • resource allocation in several markets • time-saving transactions • optimization of decision-making processes • asset specificity attenuated • acquisition of specific resources and competences • reduction of customers' acquisition costs	Alternative revenue through digital platforms and infrastructures
		Targeting niche markets and innovative high-quality products
		Sharing of skills and capacities between companies
		Open innovation and co-creation with partners and customers
		Partnership with other companies
		Integrating IoT into the value chain to reduce production costs
		Local market development
		Investment in qualified human capital
Market knowledge (general and based on experience)	• accessibility to large information databases • exchange and processing of large amounts of data • deployment of numerous online user community platforms or social networks • faster and more efficient adaptation to markets • better analyses of market attractiveness • optimization of internationalization speed and marketing gains • cross-border information asymmetry attenuated • more efficient decision-making processes • emergence of more advanced data-mining techniques (machine learning)	Better customize and personalize offers, services and the customer experience
		Regular market experiments for product and service adaptations
		More frequent introduction of new product or service versions
		Using customer feedback and comments
		Better targeted marketing and prospecting activities
		Data collection and use of predictive algorithms for modelling and interpreting data
		Using data to anticipate consumer behavior
Distance and location (psychological and physical)	• border dematerialization • acceleration of internationalization operations • reduction of psychological distances • activities led by networks rather than countries • greater transferability of a firm's specific assets • less specificity related to location • reduction of dependence on location-bound assets • management of international activities from a distance • creation of networks of users via platforms • democratization of consumption • better access to new targeted markets	Reaching a large number of markets with the same production resources
		Externalizing location-specific assets
		Developing a large community of users
		Partnerships with local companies via platforms
		Licensing products and services to local firms
		Sharing production and distribution sites
		Prioritizing decisions on proximity with customers over production costs
		Local and niche market development
Relational competences and partner networks	• increasing number of actors in markets • momentaneous markets for specific and faster transactions and interactions • larger market scope for selecting targeted markets • creation of one large virtual market for international trades • better access to local knowledge, network skills and market actors / partners • exchange-oriented rather than production-oriented • better reliability in relationships	Developing direct interactions with customers
		Data and skills sharing between partners to reach targeted networks
		Setting up processes and mechanisms to maintain relationships
		Using multiple user communities in several countries
		Making sustainable use of social networks and mass media
		Collaborating with opinion leaders and change agents
		Building and maintaining a strong online reputation

Source: from the authors

Using Foresight to Shape Future Expectations in Circular Economy SMEs

Anne-Mari Järvenpää, Iivari Kunttu and Mikko Mäntyneva

> *"The best way to keep something bad from happening is to see it ahead of time ... and you can't see it if you refuse to face the possibility."*
>
> William S. Burroughs
> Author of Naked Lunch

Future foresight in business plays a central role in companies' strategic planning, innovation, and product development activities. This is particularly true for firms operating in rapidly changing business environments, in which they may obtain significant competitive advantages by coming up with new innovations and customer solutions. This article studies future foresight mechanisms and practices in innovative SMEs operating in circular economy-related industries. The future demands set by legislation and regulation, consumer buying behaviour, and environmental consciousness, all have a strong impact on an SME's future horizon, in which there may be prosperous business opportunities as well as several challenges. This paper presents a qualitative case study conducted on seven Finnish circular economy-oriented SMEs. The case study reveals that the SMEs in this industrial sector are quite active in foresight activities, and that they have developed a variety of practices for effectively utilizing foresight information in their product development and strategic planning activities.

Introduction

The future of business and industry includes both opportunities and threats. For this reason, industrial actors need to have effective and usable methods and tools to predict possible future changes, both in their own operations and in their business environments (Korreck, 2018). Organizational foresight assumes that even if the future is uncertain, some developments can be foreseen, and thus related options for the business can be considered. This makes it possible to prepare for the future or even to more actively shape it (Cuhls, 2003).

During the last few decades, future foresight in business has become a central part of companies' strategic planning, with clear implications for the development of innovation capabilities (Rohrbeck & Gemünden, 2011; Uotila et al., 2012). However, as indicated by, for example, Jannek and Burmeister (2007), so far, the empirical research on corporate foresight in Europe has mainly focused on large companies. During the last decade, some further research has been made on foresight in small and medium-sized enterprises (SMEs), but the mainstream is still focused on foresight in larger firms. Consequently, the foresight activities and processes for large firms have been well covered in the related academic literature, whereas foresight at the level of SMEs has received less attention (Stonehouse & Pemberton, 2002).

Based on existing research, a common denominator is formed between large firms and SMEs when it comes to implementing foresight objectives. Both SMEs and large firms use forecasting to help anticipate future developments, prepare for potential changes in the business environment, and identify relevant risks. Due to the limited resources of SMEs, their planning horizon is typically shorter, and the foresight planning more focused, for example, on short-term research and development (R&D) targets, or on specific innovation needs (Jannek & Burmeister, 2007; Bidaurratzaga & Dell,

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2012). In this manner, SMEs often focus their foresight aims in order to support their short-term strategic and operational planning, as well as innovation management (Jannek & Burmeister, 2007), which often takes place in close interaction with the external environment and stakeholders (Vishnevskiy et al., 2015). Also, strategic foresight can be linked with design-based innovation (Gordon et al., 2019), which involves understanding customers' current and future needs.

The paper focuses on examining the forecasting practices of SMEs operating circular economy businesses. The notion of a "circular economy" is a rather new area of business that has strong development needs involving sustainability, new consumer expectations, and environmental targets. The current rapid changes in business environments and competition, as well as ongoing legislation, cause not only challenges but also new business opportunities for circular economic actors. To prepare for the changes so as to take advantage of them, SMEs operating in this rapidly changing business area need to continuously explore future challenges and opportunities in their business environment. For this reason, developing and utilizing effective foresight practices is essential for circular economy SMEs. Due to their relatively small size, SMEs are often rather streamlined organisations that follow the entrepreneurial intuition of their founders or management, rather than possessing highly sophisticated strategic planning tools and instruments for future foresight (Vishnevskiy et al., 2015). There is therefore an obvious need to investigate and describe the practical approaches that these companies employ in their future foresight activities, both in terms of strategic planning and innovation management.

This paper investigates the future foresight activities of SMEs operating in industries related to the circular economy by seeking answers to the research questions: How do industrial actors and service providers operating in the circular economy foresee future changes in their operational environment? And how do foresight activities affect their business development expectations? The future development of potential market demand may be difficult to evaluate for early-stage industries, which adds risk to the expansion and scaling-up of business operations. To improve understanding of how circular economy-focused SMEs foresee upcoming changes, challenges, and opportunities for their businesses, our study employs the widely applied PESTEL framework that originates from Aguilar's (1967) work, now been tweaked by different perspectives. The detailed questions related to the PESTEL framework deal with political and societal decision-making, economical changes, social issues, technological development, ecological and environmental issues, legislation, and regulatory issues. These are expected to cover the changes, challenges, and opportunities for SMEs operating in circular economy-related industries. Seeking answers to the research questions in terms of the PESTEL-based framework, this paper contributes empirical research focusing on foresight in SMEs that are operating in relatively early-stage industries related to the circular economy.

Organizational Foresight in Circular Economy-Oriented SMEs

Organizational foresight activities are used in companies to foresee possible future developments. In this manner, business leaders may consider and prepare for the future in order to act accordingly in a timely manner. As firms gain an understanding of trends, weak signals, and other developments that may impact on their business, they can build preparedness for the future (Korreck, 2018). In this process, the modeling and sensemaking of environmental uncertainty play key roles (Vecchiato, 2015). Moreover, for future-oriented innovative actors, foresight methods may provide a means to actively shape the future, and in this manner, obtain a competitive advantage in the market (Rohrbeck & Gemünden, 2011; Uotila et al., 2012). Daheim and Uerz (2008) defined organizational foresight as a process related to future intelligence gathering. Rohrbeck (2011) asserted that effective organizational foresight is dependent on organizational capabilities, such as culture and organization (for example, integrating foresight activities within a processes of foresight method sophistication, information usage, people, and networks). However, the literature provides insight into foresight activities conducted in large firms and SMEs, which both seem to have numerous common features. (Bidaurratzaga & Dell, 2012; Jun et al., 2013).

Stonehouse and Pemberton (2002) argued that not all strategic planning tools and methodologies are suitable for application by SMEs. This is because both the complexity and the time horizons differ between corporate foresight and foresight applied by SMEs. Since SMEs have more limited resources in their activities than larger firms, they are likely to implement foresight case by case. The most important trigger for foresight thinking seems to be when firms are forced to create new products (Jannek & Burmeister, 2007; Bidaurratzaga

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& Dell, 2012). Foresight activities for product and service innovation are then emphasized in the SME context.

Also, the planning horizon of SMEs is relatively short compared to that of large corporations, which can even reach up to 15-20 years (Vishnevskiy et al., 2015). However, SMEs themselves are often quite heterogeneous, since the majority of SMEs operate in conditions that require little foresight implementation (Jun et al., 2013). On the other hand, SMEs operating in areas with rapidly changing business environments or knowledge-intensive innovation networks definitely require sophisticated foresight and visionary capabilities (Uotila et al., 2012). The specific choice for SME foresight implementation should be guided be the objectives of the foresight-related activity, the available resources, and the actual readiness of SMEs to implement such approaches (Vishnevskiy et al., 2015). Thus, the greater willingness an SME has to change itself, the more it is dependent on knowledge that foresight and planning may provide. This can also support the necessary changes and R&D-related investments.

Another benefit of foresight studies is that they expand the absorptive capacity of SMEs while they interact with the company's environment (Igartua et al., 2010). Vishnevskiy et al. (2015) emphasized that even if some corporate foresight methods have reasonable potential outcomes, they still cannot be applied by SMEs due to the need for allocating significant resources, which usually are not available. The practical relevance for organizational foresight comes from a SME's inability to cope with discontinuous change. Discontinuity within the business environment emphasizes the need to constantly adapt to the environment in order to ensure economic success and long-term survival (Rohrbeck, 2011). When it comes to a firm's ability to foresee long-term future threats and new promising technologies, this is more the objective of long term-oriented corporate foresight.

The concept of a "circular economy" was first used in the literature by Pearce and Turner (1990), who emphasized a circulating flow of value and resources that has restorative effects on the environment. Current academic discussion focuses more on the circular economy as a paradigm notable for its relationship with sustainable development (Prieto-Sandoval et al., 2018). According to Prieto-Sandoval et al. (2018), the circular economy is related to the circulation and recirculation of resources. It derives from a cycle of taking, transforming, using and returning. On the other hand, some firms in circular economy-related industries take resources available from the environment and transform them into products or services. After the transformation, these outcomes can be returned as materials or energy to other value chains (Park et al., 2010; Ellen MacArthur Foundation, 2013).

The technical or biological conversion of waste into a resource is crucial. After conversion from waste, the resource can be utilized in an industrial process or, alternatively, returned to the biosphere (McDonough & Braungart, 2010). These two outcomes generate new business opportunities for SMEs. As SMEs operating in circular economy and related industries are in the early stages of industry and product life cycles, their need for foresight practices and their links to strategic planning and business development are essential. Moreover, a rapidly changing operational environment, competition, and regulation can all cause potential future challenges and opportunities that should be handled by means of foresight and planning in these firms.

The actual need for and relevance of foresight are due to a SME's ability to cope with discontinuous change. In an early-stage industrial environment, which is typical of circular economy-related industries, it is probable that there will be both discontinuity and disruption. In some cases, these can be considered threats, but for some adaptive SMEs, these can be characterized as opportunities.

Research Methodology and Data Collection

This paper is based on qualitative case study research on seven Finnish SMEs operating in the circular economy. These companies provide waste management, recycling services, and make products out of waste materials, as well as designing, building, and operating biogas plants. The data was collected by interviewing company executives, mainly CEOs, in autumn 2019. All the interviews were recorded, transcribed, and then analyzed. The interview questions sought insight on how companies are preparing for changes in their operational environment, and which changes they are expecting.

Table 1 shows an overview of the interviewed companies. The interview questions were constructed by using the PESTEL framework and related to how companies predict future changes, challenges, and opportunities in their operational environment considering the political, economic, social, technological, environmental, and legal aspects.

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Table 1. Case Descriptions.

Case	Interviewed person	Number of employees	Industry	Core business area
Case A	CEO	50	Combined facilities support activities	Waste management, recycling services and solutions for households and companies
Case B	CEO	60	The treatment and disposal of non-hazardous waste	Waste management and recycling services for households and companies
Case C	CEO	80	The treatment and disposal of non-hazardous waste	Waste management and recycling services for households and companies
Case D	Marketing and sales coordinator	20	Town and city planning	Environmental engineering design and delivering biowaste treatment solutions.
Case E	CEO	40	The recovery of sorted materials	Recovering sorted materials
Case F	CEO	10	The dismantling of wrecks	Recycling services for wrecks
Case G	CEO	10	The manufacture of other food products	Recycling and processing of oil-based material into fuel and animal feed

Results

The analysis of interview data, as well as secondary data collected from the case companies, revealed several practices for predicting changes in business and operational environments. In this section, we review these practices in PESTEL's six areas, following the interview themes of political, economic, social, technological, ecological, and legal changes in business environments. The obtained results are summarized in Table 2. Following the research questions, the table summarizes both the firms' foresight activities and the interviewed managers' business development expectations in all six areas of PESTEL.

Political aspects

The interviewed managers agreed that the environmental aspects of their business are nowadays a "hot topic" in public discourse and debate, which also reflects the impact of political decision-making. Recycling and the related themes of the circular economy play a central role in this. For companies operating in the circular economy, predicting future trends in political decision-making is thus essential, and therefore a central part of companies' strategy work:

> *We actively follow the preparation processes of new legislation because they affect our business a lot.* (Case A)

> *Legislation concerning waste management has been changing recently. Different governments have implemented the norms set by the European Union in different manners, and this has a somewhat varying impact on the local (municipal) level. This all requires us to constantly follow legislation.* (Case B)

The interview data clearly shows that the expected changes in the policies regarding environmental issues and waste management are crucial factors for firms Therefore, firms follow relevant policy-making very closely on the management level:

> *We discuss the expected political changes frequently in our board meetings, and also involve our key stakeholders in this discussion.* (Case C)

The interviewees also emphasized the role of the industrial associations that provide their companies with valuable information on trends involving the

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climate of political decision-making, which helps them to prepare for future changes, for example, legislation and policies concerning their business. In a similar manner, the industrial associations act as influencers, aiming to promote the industry's viewpoints in political decision-making:

> *Our inputs regarding the environmental legislation processes are usually collected and transferred through our industrial association.* (Case A)

Economic aspects

When asked about the economic factors affecting a firm's current operating environment, most of the interviewed managers mentioned competition in the field of circular economy businesses. This may often lead to price decreases in company products. As this field is increasing due to changes both in terms of consumer trends and environmental policies, new commercial actors are entering the field:

> *The competitive environment is getting more challenging. The prices of our products have decreased during recent years, mainly because of the increased competition.* (Case A)

> *New actors are coming in on this business, but as initial investments in the production facilities are quite expensive, the newcomers are typically big players who are already operating in some industrial area.* (Case C)

However, the circular economy business area is networked in such a way that companies competing with each other also often have areas of collaboration:

> *The big industrial players in the circular economy sector are our competitors, but still we also collaborate with them in several areas.* (Case C)

Social aspects

Our interview data clearly showed that the expectations of the consumers and business-to-business (B2B) customers were dominated by consumer trends. As "green thinking" has become a major feature in almost all areas of consumer markets, products and services are favoured that fulfill high environmental standards. This, in turn, means that circular economy firms operating in both B2B and consumer markets have to understand the importance of consumer expectations regarding issues related to waste management and the use of circular economy products and services:

> *Face-to-face contacts with our customers are very important.* (Case E)

> *Despite the fact that our company is owned by the municipalities of this region, we feel that we have to focus on end users in our services. Serving private consumers is a top priority to us, and we do it in a multichannel manner by using face-to-face contacts, phone, and also increasingly, by digital communication channels such as chat.* (Case C)

The interview data also clearly suggested that consumers are increasingly expecting service providers to develop various digital services and online tools to serve their end users:

> *Private consumers expect us to provide them with digital services.* (Case A)

> *It seems that private consumers favour more and more digital services instead of the traditional communication channels such as phone or email. We have recently launched a chat service and an online store to serve our private customers in certain services.* (Case C)

The interviewed managers also pointed out that both face-to-face customer service and newly established online tools serve for collecting valuable consumer and customer feedback that can be used in further developing a company's services.

Technological aspects

When discussing the technological challenges facing companies operating in the circular economy, our interviewees emphasized the relatively rapid pace of technological development in the field of material recycling. The companies we spoke with invest a relatively large amount of resources into developing their capabilities and facilities in order to answer to this challenge:

> *The majority of the waste is nowadays burned. It is an efficient way of processing it, but material recycling is more sustainable. Therefore, all the technological development facilitating material recycling is important for our business.* (Case C)

> *Our engineering staff is very active in exploring new technological solutions by benchmarking competitors and following the latest developments in our area.* (Case D)

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> *We participate in development projects in which new technologies are being developed for our business.* (Case A)

Another key technological aspect that arose in the interviews was the strong need to lower carbon emissions in all activities. This puts pressure on to continuously develop methods for logistics and waste collection:

> *Logistics and the emissions caused by them will be a big issue in the future.* (Case C)

Legal Aspects

As already discussed at the beginning of this section, legislation has made a remarkable impact on all aspects of circular economy value chains. This means that predicting future changes related to decision-making processes and legislation in this area are increasingly

Table 2. A summary of results obtained from the case interviews.

Political aspects	**Economic aspects**	**Social aspects**
Foresight activities: - Strategic analysis tools, risk analyses - Following the media and information distributed by the association *Future expectations:* - Environmental aspects are a hot topic in political decision-making, partly because the audience pays lot of attention to environmental issues; the circular economy is one essential part of this political debate - The follow-up and prediction of the changes in political decision-making are included in the companies' strategy work - The role of the industrial association is central: the association transmits political climate information to the companies, and tries to influence on political decision-making by promoting industry viewpoints	*Foresight activities:* - Discussions and follow-up regarding customers and competitors - Internal KPIs form a central tool for predicting the future *Future expectations:* - Competition is increasing all the time since the number of service providers is increasing, leading to a decrease in prices - To maintain a position as a remarkable actor in the business area requires investments in production	*Foresight activities:* - Customer and consumer feedback and expectations are collected through the customer service function - Face-to-face contacts with consumers in interviews, surveys, and commercial fairs - Strong investments in digital services in consumer interfaces: online-tools and chat services developed to better serve end users *Future expectations:* - Customer and user expectations follow consumption trends - Consumers are nowadays aware of environmental issues, and demand products and services meet high environmental standards - A key issue is to understand the behavior and expectations of single consumers in their waste management - Private consumers in particular expect digital services

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Table 2 (cont'd). A summary of results obtained from the case interviews.

Technological aspects	**Legal aspects**	**Ecological aspects**
Foresight activities: - Benchmarking competitors - Attending fairs, seminars, workshops, and events - Making studies on the company's areas of interest *Future expectations:* - Strong demand for low carbon emissions in all activities makes transportation into a remarkable challenge - Burning waste is often an efficient way of using it, but material recycling is more sustainable - Developing efficient methods for waste collection and logistics - There are increasing needs for digital services in consumer interfaces, planning and optimization of logistics	*Foresight activities:* - Clear organizational responsibilities defined for following the changes and trends in legislation *Future expectations:* - Legislation has a strong impact on all parts of circular economy value chains and business development - Policies and decision-making processes related to companies' environmental licenses are getting tighter - Predicting changes in legislation clearly steers companies' strategic planning	*Foresight activities:* - New tools and resources are needed to process controlling and monitoring *Future expectations:* - Carbon-neutral waste management is expected - Nowadays recycling is preferred to the previously desired waste energy usage - There are growing demands for responsibility, transparency, and sustainability in all enterprise processes

important for business development and strategic planning. The interviewees indicated that the current trend is towards tighter policies and decision-making:

Environmental laws are renewed quite frequently, and they almost always mean new investments for us due to the tighter demands. For this reason, it is very important for us to be able to predict these changes and react to them in advance. (Case C)

Ecological aspects

As indicated in the previous discussion, the ecological aspects significantly dominate the business environment of the circular economy. The economic aspects in the interview data can be summarized in three main areas. Firstly, nowadays material recycling is preferred to energy usage (waste burning). This is a change compared with previous decades, during which waste was seen as both a good and cost-efficient source for energy production. However, the current target according to government policy to re-use over 50% of waste material means that energy production based on waste burning should be significantly reduced. Secondly, consumers and societies now expect the minimization of carbon emissions in waste management. This is nevertheless a real test since waste management and recycling are very much dependent on the logistics that cause these emissions. Consequently, one central challenge is to develop solutions for a combination of both logistics and transportation. Finally, companies operating in the circular economy face growing demands in regard to responsibility,

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transparency, and sustainability in all their processes. These demands are set by consumers and customers, as well as by the government.

Conclusion

In this paper, we considered the foresight activities of SMEs operating in the circular economy. As indicated in the introduction by Jannek and Burmeister (2007), SMEs typically have narrower capabilities for future forecasting and strategic planning than larger companies. For this reason, foresight activities in SMEs often focus on more practical areas, such as collecting inputs for product development and innovation. Foresight is particularly relevant for SMEs operating in areas with rapidly changing operational environments, customer expectations, or competition (Vecchiato, 2015; Gordon et al., 2019;). In the circular economy sector, all of these areas are experiencing rapid change, which requires firms to undertake continuous foresight and monitoring activities.

In this study, we conducted a comparative case study of seven Finnish circular economy SMEs with a primary goal of understanding how companies foresee the future, and how foresight activities affect their business development. To do this, we employed the well-known PESTEL-analysis tool as a framework. The results of the study, summarized in Table 2, reveal that companies clearly understand the importance of systematic information gathering from their operational environment. As the circular economy is strongly regulated and legislation changes quite frequently, the importance of foreseeing future changes in environmental policies and decision-making was highlighted. Another central area of interest was that our interviewees emphasized the importance of interaction with consumers. As environmental issues, recycling, and resource consumption are all hot topics among consumers, they clearly expect that circular economy-oriented firms answer to the growing environmental demands in this area. We found it is also particularly important to be able to serve customers and consumers digitally. For this, there are clear expectations to provide on-line tools for customer interaction.

Based on the results, we conclude that the future demands set by changing legislation and regulation, consumer buying behavior, and environmental consciousness all will have a strong impact on SMEs' future horizons, upon which there may be prosperous business opportunities as well as several challenges. Among the challenges when an actual window of opportunity for doing profitable business is opening, are the kinds of immaterial rights that are required, when and how to scale-up a firm's capacity, when to expect pay-off for investments, the level of demand and supply, and so on. Future opportunities for business growth include the exploration of new innovative technological solutions, deployment of user innovations, and inputs for new service innovations that can be implemented in digital environments.

As a managerial recommendation, the paper suggests that SMEs operating in circular economy areas should pay attention to future foresight activities. In practice, this would mean gathering systematic information from the operational environment in all relevant areas of PESTEL. To utilize this information in future business development and planning, firms should include the processing and sensemaking of foresight information as one of their key strategic activities.

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