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Knowledge of Network-Based Market Orientation for the Internationalization of Disruptive Innovation in SMEs

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Abstract

Purpose: This study explores the knowledge development of network-based market orientation (MO) for the internationalization of disruptive innovation (DI) by small and medium-sized enterprises (SMEs).

Methodology: To manage knowledge development for DI internationalization, a business model was applied to a case study of an individual example. The studied company participated in a series of workshops and allowed on-site visits and interviews for two years in a European Union-funded project. The workshops helped the company to gather MO and networking knowledge and then apply that knowledge internally in the organization and externally, in interactions with suppliers, buyers, and other members of the buyer chain.

Findings: Although technological and market efforts usually proceed separately, this study shows that technical and MO knowledge can go together through external and internal networking.

Research limitations/implications: To overcome the limitation of having just one example in a case study, several SMEs can be included in future research to produce a comparative analysis. A further study can investigate how technical and market networks can be integrated in the knowledge development process to speed up internationalization. Managers can learn to internationalize DI by collaborating, knowledge sharing, and networking with other SMEs, suppliers, and firms in the buyer chain.

Originality: The current study contributes to DI literature by highlighting knowledge generation in SMEs from a process perspective as well as by integrating technical and MO efforts for internationalization.

Keywords: knowledge development, disruptive innovation, market orientation, network, internationalization.

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Introduction

The disruptive innovation (DI) concept has received widespread popularity in the last decades (Hopp et al., 2018), bringing radical new thinking to a highly competitive international market. Many studies investigate how resourceful market-leading companies can contribute to disruption, but these companies usually avoid involvement in disruptive processes (Christensen & Bower, 1996). Some of their reasons include expertise inefficiency in the emerging field (Christensen & Bower, 1996), internal resistance to change in favor of current business practices (Cowden & Alhorr, 2013), and the high cost of organizational rearrangements required to adopt various strategies to fit DI.

Research often assumes that small and medium-sized enterprises (SMEs) have better conditions for success with DI due to their smaller size and fewer technological constraints (Yu & Hang, 2010). Carayannopoulos (2017) observes that flexibility is associated with small young firms, which helps to establish DI. In the terminology of Schumpeter's creative destruct ion process (Swedberg, 1994), SMEs must develop innovative ability regarding products, production, market, resources, and the organization of novel industrial operations. In particular, emerging firms must adapt their products to contextual conditions to sell products to new customers (Shang et al., 2019). In a recent study, Sundström, Hyder, and Chowdhury (2021) found that SMEs with DI have a good knowledge of products, production processes, and technical requirements but commonly lack the necessary contacts and knowledge of the international market to disrupt. Therefore, we will argue that SMEs must develop market competence to reduce technology and market knowledge gap for disruption.

This case study will deal with knowledge development of market orientation and networking among different stakeholders to support DI internationalization. The resource-based theory treats market orientation as a resource that allows organizations to gain insight into market conditions (Morgan et al., 2009; Ngo, 2021). However, we deem the market-oriented perspective proposed by Kohli and Jaworski (1990) more suitable to develop SME-related market knowledge. The market orientation (MO) perspective assumes that innovative companies develop market intelligence by gathering and disseminating market information to effectively address market needs. However, instead of studying how companies apply MO, we begin with a business model in which SMEs themselves can work with different parts of the MO concept in relation to their specific businesses. Moreover, our case study approach contrasts with the Uppsala internalization model (Johanson & Vahlne, 1977; 2009) which suggests that firms can acquire the necessary knowledge by engaging in the market they want to explore. Wach (2021) describes the evolution of the Uppsala model until 2017

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(Vahlne & Johanson, 2017), observing how the content and the context changed over time concentrating on the network, entrepreneurship, globalization, and multinational aspects of the model. From the beginning, the Uppsala international model focused on large firms, omitting SMEs' limitations, thus paying little attention to the importance of networking for the market orientation of SMEs' DI, which is the gap this article will fill.

In the absence of resource opportunities and international contacts, SMEs struggle to exploit and transform the emerging innovation into a profitable concept. Medlin and Törnroos (2015) observe that most R&D firms are SMEs, but they are neither network-based nor sufficiently equipped to internationalize. The traditional MO theory (Kohli & Jaworski, 1990; Narver & Slater, 1990) concentrates on the internal coordination of data for effective use of market information, but this study goes one step further by incorporating networking for sharing knowledge with other actors to better understand customer needs (Elg, 2008). We contend that relying on MO is not enough as SMEs also need the ability to develop a network for ensuring MO inside and outside the organization, which we call the network-based MO knowledge. In this article, we define this approach as *network-based market knowledge created and developed in collaboration with actors and organizations beyond the conventional MO knowledge generated in the focal organization.*

To acquire network-based MO knowledge, we applied a market-oriented business model developed by Sundström et al. (2021) to increase the in-house capacity of innovative SMEs before facing challenges in the international market. Robertson and Luiz (2019) propose that networking and business models are suitable tools for developing a global vision that captures the understanding of technological development, institutional variables, and market needs. Business models assist SMEs in taking initiative to anticipate, address, and push for efficient changes in market approach (Skarzynski & Rufat-Latre, 2011). Sundström et al. (2020) suggest that network-based business models contribute to the otherwise unaquirable exchange of experience between different stakeholders. Our study investigated how SMEs can develop network-based MO knowledge for the internationalization of DI. We posited that MO knowledge in SMEs can be attained by interaction with different actors to overcome resource constraints. Thus, we addressed two research questions:

1. How can a business model support the implementation of network-based MO knowledge in SMEs?
2. What network-based MO knowledge is developed in the SME compared to *before* their engagement in the development scenario?

By challenging the incremental internationalization process (Johanson & Vahlne, 1977; 2009), we highlight knowledge development in SMEs to solve resource limits in marketing DI. The case study method with qualitative data was necessary for the close monitoring of the process and progress of knowledge generation. This article complements and strengthens the MO perspective by emphasizing the role of networking with internal and external stakeholders for disruption. After applying the business model, MO knowledge gets integrated in the production – and market-related phases of DI. Thus, we compared two scenarios – *before* and *after* knowledge development – to demonstrate how MO contributes to DI internationalization. This article highlights the knowledge and role of networking in MO to initiate collaboration with other firms for internationalization, which the MO approach largely misses.

After the above introduction, this study will present a theoretical discussion in three sections dealing with disruptive innovation and SMEs, market orientation and networking, and internationalization, market orientation, and networking. In the next section, we will discuss methodological issues including data collection and analysis. Then, we will present the case study on knowledge development constitutes the later part of the study, followed by results analysis. The article will conclude by addressing how the research questions were addressed and what major findings were identified. Finally, we will outline research and managerial implications.

Disruptive Innovation and SMEs

Christensen laid the foundation of disruptive innovation theory in his famous 1997 book *Innovator's Dilemma*, in which he explains why firms with abundant capabilities fail to respond to market competition. According to Christensen, Raynor, and McDonald (2015), DI is a highly risky and complex process to be handled over the long term, because it develops from new, yet-to-be-tested market and product ideas. The process also involves responding to the DI's impact on incumbent innovations as these are exposed to new competitive situations. Researchers and practitioners have sought to understand how companies can create opportunities – or compete – to succeed in that process (Martinez-Vergara & Valls-Pasola, 2020). However, many innovations fail to achieve disruptive status (Christensen et al., 2015), and an important issue was raised: How mature companies with high executive capacity would risk losing a market they dominate (Shang et al., 2019)? Market orientation of disruptive innovation could be a difficult task when customers do not know that certain innovations exist (Chriestensen et al., 1996) or when the same company happens to sell both the old and the new product (Schmidt & Druehl, 2008).

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A link to DI can be traced back to Schumpeter and his discussion of creative destruction and entrepreneurship (Swedberg, 1994), according to whom there are five types of entrepreneurship: new product, launch of a new production method, opening a new market, conquering a new source of raw materials, and organizing a new industry differently. These types of changes – commonly influenced by external factors and situations – are usually called innovation (Swedberg, 1994, p. 52) and are often the work of entrepreneurs, who traditionally come in SMEs. According to DI literature, SMEs can combine different new efforts to create radical solutions. However, to gain power over the situation, SMEs need access to fundamental production, financial resources, and knowledge to conduct DI.

Recently, the research on DI internationalization often refers to definitions established by Christensen et al. (1996; 2015). For instance, one team looked at the internationalization effects of DI (Martinez-Vergara & Valls-Pasola, 2020), while another addressed the complexity and work to be done before DI reaches the international market (Rasool et al., 2018). The latter discuss how resources can be exploited before entering new markets and finding new customers. Burgess & Steenkamp (2006) argue that disruptive innovations can expand the market by offering to consumers a product they would not buy otherwise.

Christensen et al.'s research is both admired and disparaged (Schmidt & Druehl, 2008; Yu & Hang, 2010). Many discussions concern the conflicting relationship between incumbent and disruptive innovations as well as the question whether and when DI exceeds customer demands (Schmidt & Druehl, 2008). Govindarajan and Kopalle (2006) introduce the concept of high- and low-end disruption, which provides a general explanation of the DI features relative to the market. High-end innovations are defined to be those entering a market by asking a higher price without satisfying mainstream customer needs, while low-end innovations offer a lower price, thus attracting mainstream customers and markets (Yu & Hang, 2010). We may assume that SMEs with limited resources will target a low-paying market to start the disruption process. Sundström et al. (2020) claim that by developing network-based MO, innovative SMEs must gather information and knowledge of international market needs to gradually replace incumbent offerings with new products and services. Głodowska et al. (2019) discuss the importance of identifying different types of knowledge that may change the internationalization process. However, this study adds knowledge on how – through network-based MO – SMEs can develop market knowledge that has an influence on the DI internationalization.

Market Orientation and Networking

The studies by Kohli & Jaworski (1990) and Narver & Slater (1990) have influenced MO research regarding innovative implications and organizational performance. Market orientation deals with proactive customer orientation based on market knowledge transformation and developing organizational intelligence throughout the organization (Kohli & Jaworski, 1990). According to the MO perspective, organizations collect market information concerning current and future customer needs and desires. Kohli and Jaworski (1990) describe MO in three major components: generation and dissemination of market information and, then, application of the acquired competence to effectively respond to customer needs. On the other hand, Narver & Slater (1990) stress the inter-functional coordination of core activities to develop an innovative business culture. These two studies offer complementary and useful knowledge to SMEs because Narver & Slater (1990) discuss the development of innovativeness as part of company culture, whereas Kohli and Jaworski (1990) concentrate on improving company responsiveness by gathering market intelligence. For DI to flourish, it is important that SMEs have an innovative responsive climate with a clear knowledge of the target market.

Since MO depends on both its own and market context, the moderation of external factors can significantly influence MO performance (Sundström et al., 2021). External factors and moderators (market turbulence, competitive or collaborative environment, stable economic standing) are contingencies that directly affect the MO–performance relationship (Kohli & Jaworski, 1990). Mediating effects often refer to internal work facilitators (i.e. learning capacity, human resource management, and implementation issues) undertaken to improve performance (Liao et al., 2011). Sundström et al. (2021) observe that external factors can directly affect a company's MO initiatives, which in turn can affect DI performance.

Market-oriented companies develop a long-term process to understand the latent needs of customers for proactively creating superior value and pioneering solutions for customers. However, SMEs find it difficult to meet the requirements for becoming market-oriented. Value creation needs to be supported by proper strategic leadership (Dyduch, 2019), which might not be available in SMEs. Sundström et al. (2020) notice that to internationalize DI, SMEs can learn the MO process in collaboration with firms in a similar situation. A characteristic of market-oriented companies is that they "continuously create superior customer value by sharing the knowledge broadly throughout the organization and by acting in a coordinated manner" (Slater & Narver, 1998, p. 1003), which is also termed organizational innovativeness. We argue that MO activities must spread beyond the SME and be applied in relationships with partners. Elg

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(2008) finds that inter-firm MO activities are jointly performed by two or more independent companies to create networks or relationships in response to final market demands. We consider network relationships vital in the internationalization process, especially for SMEs to deal with resource limitations, knowledge sharing, and new opportunities identification. In particular, we argue that SMEs can develop market-related knowledge in three different ways: (1) own knowledge development, (2) the gathering and spread of MO knowledge from the market, and (3) the share of knowledge through networking by inter-firm MO.

Developing networks and securing contributions from other actors are critical in bringing new technologies to market (Story et al., 2009). Chetty & Wilson (2003) argue that networks represent a critical point of investigation in understanding internationalization when there are resource constraints. All firms – be it small or large ones, manufacturers or service providers – are at the mercy of their environment to establish themselves, operate, and survive. According to Fregidou-Malama & Hyder (2015), a network consists of the exchange of information, knowledge, and the accumulation and coordination of resources between the interacting parties. By networking, firms access complementary information, markets, and technologies (i.e. technical or commercial resources and capabilities) they need for innovation (Corsaro et al., 2012).

In their review of literature on networking and innovation, Pittaway et al. (2004) recognize the importance of networking in promoting innovation across and within firms. Thus, SMEs require networks for their internationalization due to resource constraints (Gil-Barragan et al., 2020). Therefore, a focus on networking for accumulating resources is vital for SMEs to initiate, innovate, and finally, popularize the innovations in the international market. Nevertheless, what is missing in most innovation-based network research is the knowledge of MO. Research on networking for innovation highlights the role of actors, activities, and resources (Corsaro et al., 2012) but without clear emphasis on customer needs.

Internationalization, Market Orientation, and Networking

While internationalization presents an opportunity for many SMEs, it can also be a burden to take promising products across borders. For SMEs, it is expensive to follow the experiential learning in foreign markets suggested by the Uppsala model (Johanson & Vahlne, 1977). It means that SMEs can run into risk if they get into an unfamiliar market without knowing how it functions and how to deal with the specific foreign environment. The SMEs need another way to gather market knowledge that they can

afford and handle. As an alternative, we propose that SMEs – particularly disruptive innovative firms – do their homework by networking with other firms before developing inter-firm MO. This observation agrees with Hunt & Lambe (2000), who consider inter-firm MO a crucial part of networking. In this study, we defined inter-firm MO *as market-related activities that happen in the collaboration of firms such as buyers and suppliers.* This type of networking is not one-directional but results from joint and shared efforts of partners, which in turn engenders network-based MO knowledge.

Hyder & Fregidou-Malama (2009) observe that mutual awareness in foreign markets can be gained by reducing cultural gaps through adaptation, and firms can improve their reputation by adopting successful product and service standards of the foreign firm. Internationalization needs firms to clearly know how a target market differs from their domestic market, and how the two are interlinked (Rissanen et al., 2019). Thus, innovation and technical knowledge are highly important but not sufficient for the successful internationalization of DI. Thus, MO theory suggests that complementary market knowledge gathered and disseminated in the organization is needed to complete the DI process. Erdil et al. (2004) found that MO is closely linked to innovation and is a major element in the innovation process (Menguc & Auh, 2006). Innovation-oriented SMEs need both internal competence and the ability to coordinate and collaborate with others to meet international requirements (Radicic & Djalilov, 2019).

By examining previous studies, Elg (2008) found that the nature of the inter-firm relationship affects the internal MO of the individual retailer or manufacturer. There is a positive relationship between the interacting retailers' and suppliers' internal MO as well as between internal MO activities and the overall quality of the inter-firm relationship. Thus, internal and external networking support internal knowledge development (technology and market knowledge) and share the acquired knowledge with outside actors. Sundström et al. (2021) criticize MO research for being unidirectional, focusing on data collection, and not giving much importance to external relationships. This article highlights this major theoretical gap by introducing and connecting internal and external networking for the collection, dissemination, and sharing of technical and market knowledge. We argue that internal and external knowledge development are interrelated, so SMEs must consider them jointly for DI internationalization.

Methodology

This study applied a theoretically developed market-oriented business model (MOBM) advanced by Sundström et al. (2020). The model was developed and tested through

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action research on four innovative SMEs in 2017–2019 as part of a European Union Structure and Investment Fund project in Sweden. The selected SMEs went through four work packages in the project to develop their MO-based knowledge requiring networking skills for internationalization. In brief, the SMEs were engaged in three main activities (seven meetings in total): gathering information on the international market, disseminating this knowledge in the organization, and responding to the information with revised market plans and strategies. The inputs of the SMEs gathered through seminars, workshops, on-site visits, interviews, and idea exchange were combined with academic knowledge as part of the dynamic and interactive process (Sundström et al., 2020; 2021). Individual analyses were conducted on the data collected to address the aim of individual research studies.

This article deals with a single example that generates knowledge and understanding on the market-oriented DI perspective, emphasizing how networking between different stakeholders is developed and adapted to support one of the four SMEs' product internationalization. During knowledge generation, the selected SME had the possibility to revise the business model to suit its constraints and needs. Gummesson (2017) argues that a thorough study is necessary to understand and deal with complexity in marketing. Głodowska et al. (2019) highlight the qualitative approach and the need for further studies in internationalization research. This study analyzed how the SME called Alpha organizes and works with internal and external networking that deals with technical and market-oriented knowledge for DI internationalization. To highlight the impact of learning, the analyzed activities and performance have been divided into two phases: *before* and *after* knowledge development.

By applying the qualitative method, data was collected on a continuous basis throughout the project over a period of two years. The qualitative method was found suitable to handle the high level of interaction and complex data for theory development and further studies (Eisenhardt, 1989; Yin, 2014). Further networking between the participating SMEs was an important aspect of the learning process. To tackle this kind of practical problem and theory development, the data was required to cover activities and interactions, actual processes, antecedents, and consequences of activities by participants in a relational system (Doz, 2011).

Major sources of the data were interviews with Alpha's CEO and marketing manager, e-mail conversations with Alpha, on-site observations in the company, workshops with Alpha's other SME partners in the marketing network, and seminars with support organizations. Two meetings were conducted with the CEO, whereas several meetings happened with the marketing manager in 2016 and 2019 (Table 1). Observation was

conducted on Alpha's premises to see how production occurs and how marketing efforts are conducted. Alpha allowed the researchers to visit their factory and extended full support during the research process. This type of backing gave the researchers confidence to start and complete the project within the stipulated time. Along with Alpha, three other SMEs involved in disruptive innovation, took part in the project. Whole-day workshops were organized on factory premises in connection with the SMEs' presentations and development work. Individual interviews happened on the Alpha premises to discuss market challenges and opportunities experienced by the other SMEs. Seminars were conducted with the networking SMEs, the supporting organizations, and the innovation centers to highlight practical issues involved in internationalization.

Table 1. Information on data collection

Type of sources	Participants	Location	Duration (hours)	Date
Interviews	Alpha CEO	Alpha premises University premises	3 2	March 2017 May 2017
	Marketing manager, Alpha	Alpha premises University premises	3 3	March 2017 May 2017
	Manager, innovation center	University premises University premises	2.5 2	October 2016 February 2017
	CEOs, SME partners	SMEs premises SMEs premises	2	March 2017
	CEO and Marketing manager, Alpha	Alpha premises	2	November 2019
E-mail conversations	Alpha CEO	–	–	May 2017
	Marketing manager, Alpha	–	–	June 2017
	Marketing manager, Alpha	–	–	August 2019
Observations		Alpha premises Alpha premises	2 2	March 2017 November 2019
Workshop with Alpha, SMEs, and Innovation Center	CEOs and managers CEOs and managers CEOs and managers Alpha CEO and managers	University premises SMEs premises SMEs premises SMEs premises	7 6 6 6	November 2016 February 2017 April 2017 June 2017

Source: own elaboration.

Data was analyzed in two steps: finding a practical solution for the internationalization issue and developing a foundation for discussion and drawing conclusions from the scientific findings (knowledge exchange). The first analysis was related to the imple-

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mentation of the MO process, and so it had to be done quite often together with the SMEs, particularly in relation to meetings and workshops. Data was used to analyze two different situations: *before* and *after* network-based MO was applied in the project. With the support of MO-based business model, the SMEs went through a learning process in the project relating to MO and its implementation through gathering new knowledge and exchange of ideas, particularly among the participating firms. This procedure helped us to provide information about the studied company's network-based MO knowledge development during the project.

For the second analysis, the transcribed data were gathered in a database. Following Miles (1979), data was condensed by refining, iterating, and revising the existing frameworks. This analysis was conducted in three different phases. First, the analysis process began with researchers' familiarization with transcripts and notations from each interview. Second, important aspects from the transcribed interviews were selected, so that illustrative coding and categorizing were done with the help of NVivo (Maher et al., 2018). Third, based on the codes, memos were developed to theorize ideas and develop themes, thus conceptualizing the information with the help of NVivo (Maher et al., 2018). The three phases of the second analysis allowed us to discover two main themes: (1) technology is the focus but not MO, and (2) technology, innovation, and MO receive priority. These two themes were then linked to the phases *before* and *after* the network-based MO knowledge development. Table 2 shows the complete process from illustrative coding to developing themes. According to Doz (2011) and Eisenhardt & Graebner (2007), the rich qualitative data generated by this study supported theory development.

Table 2. The process of illustrative coding and developing themes

Extracts from interview data	Illustrative codes	Memos	Categorizing themes	Phases
"it's 3D machine. Right now, I think we put the most resources there"	Prioritization of technology and innovation	Focus on technology	Technology is the focus but not MO	a) Disruptive innovation and market orientation before knowledge development
"Our German collaborating company helps us to create disruptive innovation"		Priority for innovation or disruptive innovation		
"Market or buyers are often not our main focus, instead technological innovation is a priority for us"		Market orientation is not important		

"Products with better technology can give us better business"				
"We are now focusing on receiving information gaining knowledge of the market related to technological innovation offered by us" "We are trying to receive market information and discuss with the organization to develop strategies for influencing the market" "Knowledge sharing with SMEs allowed us to understand the importance of market orientation" "Network with customers and suppliers can give us exact information about the market trend"	Emphasis on market orientation Motivation for collaboration	Market orientation also became a focus Effect of internal market knowledge dissemination External collaboration creates knowledge development regarding market orientation	Technology, innovation, and MO receive priority	b) Disruptive innovation and market orientation after knowledge development

Source: own elaboration.

Case Study on Knowledge Development

The case study on the example of Alpha is presented to reflect on MO and networking activities for DI internationalization. The case study is divided into two parts to distinguish the role of knowledge development in the company. The first part describes what the Alpha has done to develop DI and to market it internationally prior to knowledge generation about MO. The second part illustrates the technical and market-related activities after the application of the business model for knowledge development.

Company Background

The company Alpha was founded in 1984 to manufacture 2D machines for roll forming of sheet metal. In simplified terms, a flat strip of steel enters a machine to then emerge in the shape desired by the customer. The sheet can be bent, folded, stamped, or profiled to shape it into different forms, such as curtain poles, downspouts, or shelf brackets. With the new advanced and dynamic 3D roll-forming technology, creating variable shapes have been an emerging business area for the company. Alpha operated

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with 10 employees and had sales around SEK 10.6 million in 2019. It has produced more than 100 traditional 2D roll forming machines in the past 32 years.

In traditional roll forming (2D), the plate passes a series of roller pairs that successively change the flat constituent plate to the final required shape. The shape of the profile is the same along its entire length. The new technology for advanced dynamic roll forming (3D) means that the included plate passes several individually movable computer-controlled forming pairs that allow the finished profile to vary along its length. Moreover, the technology developed by Alpha provides the opportunity to bend the profile during ongoing roll forming. The company developed advanced roll forming machines in 2009 to produce light, more accurate and environmentally friendly products to meet the increasing demands of their customers. The machines were commercially developed during 2013–2015. Alpha claims to be the only company in the world that has successfully developed an advanced machine to manufacture high-quality products while offering the maxim level of flexibility.

Before Knowledge Development

The company works in three general areas: (1) servicing, including supply of spare parts to 2D machines, quality control, and examining machines; (2) designing roll stands for new profiles or adjustments to existing profiles, and upgrading extant machines; and (3) developing new dynamic machines by DI.

Activities 1 and 2 are performed by using the conventional 2D roll-forming technology. The third activity deals with DI, which requires an investment of SEK 10 million for each machine, making it difficult for customers to finance the project. There are many interested buyers, but the project can only happen if the financing is arranged. Usually, negotiation and preparation take a year before a delivery happens. Alpha can deliver a complete advanced line in eight weeks. Fifty people inside and outside the company must work full time for the installation and completion of the project. To support their operations, Alpha built its own factory and demonstration plant in Sweden.

The new advanced and dynamic roll-forming technology is a challenge to 2D, which uses a traditional method and restricts the shapes that can be created. A large number of worldwide patents protect Alpha's technology for advanced dynamic roll forming. The process of development from 2D to advanced roll forming took more than 29 years of total concentration on technological knowledge and improvement.

By focusing on technology, Alpha works closely with its main German supplier, a large, globally known manufacturer of household and industrial machinery. This technical collaboration is highly beneficial for the company and has resulted in further improvement to the DI product. Alpha technicians work side by side with the supplier and conduct a weekly dialog with the team. Recently, in collaboration with the German supplier, Alpha has started a joint project to develop a standard system to control and improve production lines. This is the biggest joint project the SME has ever had. Alpha has developed good contact with different people in the German supplier organization, which ensures the requisite support to develop their products. In connection with the DI product, the supplier has given them great support and attention, even though they are a small company. Alpha clearly explained their vision to the technical sales staff as well as to the manager of the German supplier, who believes in the company's ability to reach the international market. When Alpha gets an idea for a new machine and needs some changes to the extant machine, it runs testing on the new concept with the support of the supplier. Moreover, this supplier provides information and knowledge on new trends in the industry, considering the needs of machine buyers, which means that Alpha can upgrade its innovation if required. However, dependence on one supplier has been an obstacle to extending Alpha's technical network and obtaining full support in developing DI. Some network relationships have been developed with other local suppliers, but Alpha needs more support at the international level to offer complete machines and services to the buyers.

Alpha considers the advanced roll technology to be the future of metal forming for sophisticated use in different industries. However, Alpha finds its high technological competence to be a challenge for market development. In fact, there was no scope for market-oriented thinking due to concentration on product development. Alpha completely focused on technological development and building up networks with suppliers who could solve the technological issues involved in the development of the 3D technique. The concentration has been on the technical knowledge of DI, so less time and resources were left for market-related efforts. Alpha has no plan for market orientation and no specific target market has been fixed. Work on marketing data and internal collaboration to respond to buyers' needs have been totally missing in the organization. The company has treated the whole Nordic region as their market and sold their products without developing proper marketing networks. The Alpha CEO comments:

> From the outset, we had a high level of creative skills, which were often driven by an innovation mind-set rather than what the market needed. We realize an increasing need to change focus in order to create profitability in an increasingly competitive industry.

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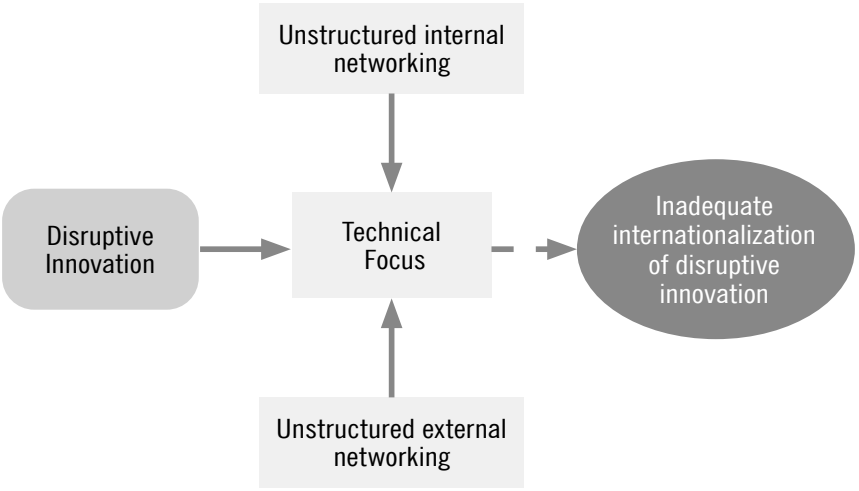
Figure 1 illustrates how the company has worked to develop its machines (products), particularly in relation to DI. Focus on technology has dominated; there has been no scope for concrete discussion and gathering market-related knowledge. In the next section, we will elaborate on knowledge development for DI-based market orientation and networking in SMEs by applying the business model.

Figure 1. The knowledge *before* the development phase of SMEs disruptive innovation internationalization



Source: own elaboration.

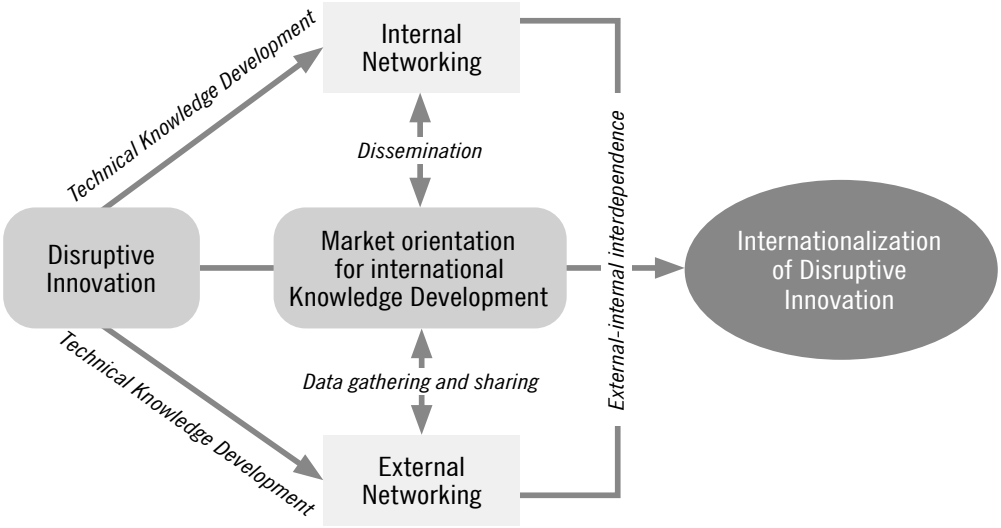
After Knowledge Development

With the intention to gather market knowledge for DI internationalization, Alpha has applied the business model developed on the principles of MO. The conducted activities included gathering and disseminating information by internal collaboration and by responding to customer needs through networking with external actors. Alpha management concentrated on MO by focusing on internal knowledge development, team building, and understanding the market in relation to its technological competence. Alpha's marketing manager summarized their needs from collaboration with other SMEs and the university as follows:

> (1) Understanding the market, (2) exchange of experiences and extending their network, (3) meeting people and companies in the same situation, and (4) working with real-world customers while participating in the collaboration network.

By collaborating with other SMEs, Alpha has learned the importance of sharing ideas and made effective use of limited resources. The company focuses on internal collaboration to deal with customer needs and how to fulfill those needs. Figure 2 illustrates how MO and networking develop DI thanks to knowledge development by the business model application.

Figure 2. The knowledge *after* the development phase of SMEs internationalization of MO disruptive innovation



Source: own elaboration.

Alpha started to contact the market on which it wants to concentrate. By applying Alpha's business model and partaking in the workshops, the company managers gathered practical information on the market conditions and how to build MO thinking in the company. The other SMEs participating in the knowledge development process were in a similar situation and understood each other's problems and limitations. The participants spontaneously engaged in networking and came with suggestions to support the marketing effort of their companies. The information received in the workshops dealt with knowledge of practical marketing, the role and management of cultural differences, social responsibilities and environmental issues, rules and regulations in the target country, and tips on other interesting firms for possible collaboration. Networking among the participating SMEs has been helpful to identify the problems and jointly discuss how to address them considering each partner's own situation. The culture of sharing information and knowledge with others was previously absent at Alpha.

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Practical learning comes from the experience of other firms, whereas in-depth market development insight stems from academic lectures and business models used for problem-solving. However, Alpha realized that the purpose is not only to collect market information but also to disseminate knowledge throughout the organization and collectively respond to customer needs. Furthermore, Alpha understood that it is not enough to discuss market issues after the innovative production. It is equally important that customer needs were integrated and discussed already at the early stage of innovation. Alpha observed that late adjustment is time-consuming and insufficiently beneficial.

During the knowledge development process, Alpha developed separate market strategies for each business area. Currently Alpha deals with three market strategies:

1. 2D rolling machine, used by around 200 factories; Alpha sells this product in Scandinavia but wants to leave this product area due to increasing competition and diminishing profits.
2. Service, dealing with maintenance and support of machines supplied in the past; this strategy provides a secure income and helps Alpha to keep contact with the customers and find potential users.
3. Advanced, 3D rolling machine, which is the DI that can change the structure of the market; to achieve success in this area, technology must be linked with market thinking, and the whole staff must become market oriented.

For developing small machines, Alpha collaborated with a Swedish supplier. The current supplier was new, but the relationship was growing. The Alpha CEO thought that geographical nearness is vital in constructing complicated machines and instruments. They relied on each other and closely evaluated the project from both partners' viewpoint. An important collaboration happened in relation to pricing. The supplier took their whole staff to the Alpha factory to get an idea of how the SME feels about the machine. The goal was to give the supplier staff a complete view of the production process, so that each staff member knew what parts they would be producing in the whole system. According to the marketing manager at Alpha, this helped a lot in the next step, when the supplier provided tips to improve the products and production process. In the early days, Alpha used to deliver designs to one supplier and explain the details of its functioning. Now the process changed, and the supplier started sitting together with the people involved in the development of the product. Alpha considered the first impression to be important, and so it has changed the appearance of the factory to impress visiting customers.

Disruptive innovation based on advanced technology was new in the market and required a huge investment. Their technical networking with suppliers worked quite well yet without links to the buyer chain. The DI market was complex: Alpha procured machines for other companies who needed to find customers for their products. Collaboration was necessary beyond the buyers' level. Therefore, Alpha sought to build networks of customers with their potential buyers. Major suppliers in the technical network could provide important support in this respect, but Alpha did not reach that stage yet. In turn, Alpha initially identified a couple of industries – namely construction and transport – that could greatly benefit from advanced products and their precision. Due to poor preparation and the lack of market orientation, Alpha faced problems in quickly attending to customer inquiries related to the use of the machines. It was confident on the high quality of their machine but not yet succeeded in organizing its MO activities. The company took new steps during the recent development activity to design market-related packages with all the relevant information that potential customers might seek. Alpha started to disseminate information on customer needs in the organization and discuss how they can address them in a professional way. Thus, support from the German supplier was integrated into the marketing effort so that a clear link appeared between the production and marketing efforts.

Discussion

This study demonstrated the importance of knowledge development by dealing with market data through internal collaboration and the extension of the knowledge support effort for the DI internationalization. Knowledge development happened through three different approaches: knowledge exchange in workshops, interaction in the organization including restructuring of roles/responsibilities, and a clear emphasis on the market that is manageable. The two phases – *before* the application of the business model (technology is the focus but not MO) and *after* MO-based knowledge development (technology, innovation, and MO receive priority) – showed how the SME struggled to achieve both technical and market knowledge focus.

In the *before* phase, Alpha concentrated on the quality and newness of the product to strengthen the disruptive nature of innovation. Its motivation was to become a leading innovative actor in the field. However, Alpha had to pay the cost for the inability to focus on the market. Consequently, innovation and marketing became two separate fields of action with no integration. This technique-focused scenario dealt purely with managing relationships with main suppliers by ignoring MO and failing to attend customer needs. Håkansson et al. (2009) highlight that in supply chains the focal company

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must develop contacts and integrate their activities with suppliers and buyers, and these activities must happen simultaneously. Although not boldly, Kohli & Jaworski (1990) did recognize the importance of networking, particularly in relation to external factors and moderators that influence the MO process. A further complication has been to reach and develop effective contacts with the buyers' customers who have a say in choosing a product (here: machine) and the DI internationalization.

Network-based MO was neglected in the *before* knowledge development phase, while even internal collaboration for data dissemination was a rare occurrence. This observation goes against the finding of Elg (2008), who claims that an inter-firm relationship is necessary to develop internal MO in reorganizing activities to focus on both technical and market-related issues. As a result, insufficient network support hindered the collection of customer data and its distribution in the organization, as was also observed by Sundström et al. (2021). However, there was a functioning relationship in the production network, but it concentrated on the main supplier. This lone but strong relationship made Alpha highly dependent on its partner. However, the situation was not unique, as most SMEs suffer from resource scarcity and insufficient contact with different firms (Medlin & Törnroos, 2015). On the market side, the state was worse because no organized attempt was made to target and concentrate on a certain market. In fact, MO knowledge was missing in the organization, and there was no internal preparedness to deal with customer needs prior to the implementation of the knowledge development business model.

The *after* network-based MO knowledge development phase started to address the above issues by applying the business model discussed by Sundström et al. (2021). Knowledge generation concentrates on the MO principles to streamline the gathering and dissemination of information and respond to market needs by analyzing the data. Internal collaboration helps SMEs to differentiate between potential markets to focus on a certain market. Narver and Slater (1990) found the inter-functional coordination of core activities necessary to develop an innovative business culture. Based on the market, in the *after* phase Alpha differentiated their market strategies distributed the responsibility in the organization in the management. This split in leadership and responsibilities meant that different managers had to initiate networking for knowledge exchange with important actors in the buyer chain. Głodowska et al. (2019) observed that firms with entrepreneurial orientation use network knowledge in the initial and mature stage of internationalization. The applied strategies acknowledge the need for combining internal efforts on innovation with market communication and establishing important contacts with external actors in the buyer chain. Radicic & Djalilov (2019) highlight the firms' ability to develop strong internal knowledge capacity, resource

coordination, appropriate policy formulation, and innovativeness to fulfill business goals.

Advanced roll forming is not only a challenge for the traditional 2D machine but also for the marketing of the new technology. The DI was unknown in the market, so no previous idea had been available on how to market it. Christensen et al. (2015) recognize that DI is a highly risky project that deals with untested, radical market ideas. The theoretical discussion suggests that – through learning – SMEs can compensate for the lack of knowledge about the market and network-building. Indeed, the knowledge development process indicated that Alpha was willing to adjust to MO requirements as suggested by the industry partners and academics, who also participated in the series of workshops with Alpha. Following the business model, efforts have been made to establish some initial contacts so that market information could be gathered for developing MO in the organization and responding to customer needs for the DI internationalization. Alpha made a great effort to integrate its technical network with the market network and to reduce the market knowledge gap for technicians to deal with DI.

Conclusion

As part of a European project, this study has illustrated how SMEs can internationalize disruptive innovation by developing network-based market orientation knowledge. We assumed that MO knowledge in SMEs can be enacted by interaction with different actors through the application of a business model. To that end, we considered two research questions: How a business model is implemented in the SME? And, how network-based MO knowledge developed? This study has delivered several findings: (1) prior knowledge of MO and internationalization is essential before SMEs start operating in the international market; (2) knowledge development according to a business model makes a striking difference in the attitude and handling of a company's market-related efforts; (3) internal knowledge development through gathering and dissemination of data and relating it to external activities is a key market-related factor; and finally, (4) by network-based MO development and by narrowing gaps between technical and market knowledge, firms ease their role in the buyer chain and DI internationalization.

In sum, this article has examined the marketing process of DI via the analysis of an innovative SME. To distinguish the role of knowledge development on internationalization, two scenarios were identified. The first scenario, which covers the time prior

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to the application of the business model, revealed high technical focus, low internal collaboration, weak support for external activities, and an absence of networking with external actors. The other scenario, which applies to the business model, showed improvement in the dissemination of data, internal collaboration, and market focus through initiating an exchange of knowledge with external actors. Moreover, we observed Alpha's strong willingness to balance technical and market efforts, streamline the relationship between internal knowledge and external activities, and increase networking to gain a better understanding of the buyer chain.

This study has taken a practical approach to highlight MO knowledge gathered by continuous interaction between the studied company and other SME participants involved in DI. This approach is quite unique because most studies concentrate on previous performance and analyze what has been achieved and how. Given the technical complexity of the product (advanced roll forming) and SME resource constraints, observing both recent performance and ongoing performance can be a suitable way to follow the internationalization process of DI. Furthermore, this was a rare opportunity to use theoretical knowledge in practice while producing feedback to revise the suggested model and contents of the workshops based on MO principles. This study has responded to Christensen & Bower (1996), who found the lack of expertise in the new field to be the major obstacle for firms to engage in DI. By applying a business model, we have shown how an SME can acquire internationalization knowledge before entering the market. This approach is also a challenge to Johanson & Vahlne's (1977, 2009) argument that firms must be in the market to gather market knowledge for internationalization.

Implications and Future Research

This study makes several theoretical contributions. First, major MO researchers like Kohli & Jaworski (1990) or Narver & Slater (1990) concentrate on the internal activities in the organization as central MO issues that should be applied to fulfill buyer needs. This rather inactive approach can work for most businesses under normal circumstances. However, for DI internationalization, one must be proactive in developing contacts with external actors. Therefore, we have introduced network thinking in the business model to show how SMEs can develop and practice knowledge sharing to ease market entrance. Second, the comparison between the two scenarios has helped us to identify what knowledge is missing and how the business model can be revised and enriched to support the knowledge development efforts. Furthermore, this study offered the possibility to evaluate how SMEs can benefit from the application of an

MO business model. Fourth, technical and market issues were previously treated separately, making DI internationalization harder. From a theoretical perspective (Elg, 2008; Robertson & Luiz, 2019), this research highlighted the interplay between internal and external networking to close the technical-market knowledge gap.

Several managerial implications can be identified. First, this study offered SMEs the opportunity to learn by doing through the application of their own business model, which they can revise and update whenever needed. This knowledge development goes against the traditional internationalization process. Second, managers learn the importance of networking both inside and outside the organization to support DI internationalization. Market-orientated knowledge generation is an interactive process that managers cannot confine to the coordination of internal activities. Third, managers should simultaneously emphasize market and technical development by considering customer feedback while the product is developed. Alpha's case was even more complicated as machine buyers must know their customer needs, and this knowledge should be transferred, disseminated, and finally, channeled to different actors in the buyer chain.

Only one company was included in this study, so several SMEs involved in DI could be studied in a future comparative analysis. A future study could focus on technical and market networks and how to integrate them with knowledge from industrial marketing research. The idea of knowledge generation prior to market entry was restricted to one industry. This approach has also research potential for other industries and larger firms. SMEs participating in knowledge generation undergo a development process while the achievement of DI internationalization can take time. A follow-up study of the SMEs could offer new insights to enrich our observations and support the improvement of an MO-based business model for internationalization. In line with Głodowska et al. (2019), different types of knowledge developed in SMEs internationalization process can also be an interesting topic for further study.

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