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Interwoven innovation
Transformative pathways in textile business networks

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1. Transforming the Business Offering from products to solutions. An inquiry into the textile industry
2. Supplier-customer relationships for sustainability-led innovation in the textile industry
3. Beyond Size: tracing the development of a Startup and Medium Sized Company Relationship and the influence on the business network.

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Interwoven innovation
Transformative pathways in textile business networks

Introduction

The textile industry – History, Tradition, and Innovation

Initiated in 2020, this research project is driven by a profound interest in the textile industry, a sector steeped in tradition and historically linked with the old economy. It stood as a cornerstone at the close of the 19th century during the second industrial revolution and, with time, it has adapted and developed while preserving its traditional and unique manufacturing techniques. After all, what is a fabric without the timeless interweaving of warp and weft threads?

Originally, Textile emerged as a conventional sector, initially gaining favor through the use of household looms to create textiles for everyday use. Despite its initial small-scale production tied to this production method, it has been a catalyst for innovation over time. The introduction of two transformative innovations, the flying spool and the steam engine, caused a significant disruption to conventional practices, resulting in a transition from a household economy to large-scale production. This transition marked the genesis of the capitalist economy and large-scale production, setting the trajectory for today's economic structures.

It can be argued that textile production played a pivotal role, metaphorically providing water to the looms of innovation¹. The proliferation of spinning and weaving in late 19th-century in Manchester fostered increased production and technological advancements. The reciprocal relationship between intensified textile manufacturing and inventive advancements established a virtuous cycle that extended beyond the textile sector to encompass other fields, including mechanics and chemistry. Notable examples include advancements in textile production

¹In a technical context, supplying water to the loom refers to providing power to the mechanical looms used in textile production facilities. This terminology is still employed in the current Italian textile landscape.

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machineries, traditional and jacquard cloth production techniques, synthetic fibers, and fabric dyeing methods.

In the contemporary landscape, the textile industry faces the challenge of adapting to a multitude of changes that stem from volatility in consumer preferences, modifications in the supply chain, global competition, and evolving manufacturing locations. While in the past, the industry primarily focused on natural fiber-based fabrics, it now contends with the emergence of synthetic fabrics, a consequence of advances in polymer processing. This shift has led to a significant dichotomy within the sector, distinguishing between traditional and technical textiles, where performance-related attributes often outweigh the aesthetic and intangible elements associated with traditional fabrics.

Sustainability adds another layer of complexity to the dynamics of the industry, given its significant role in influencing nowadays business environment.

Indeed, according to a study by the United Nations Environment Programme (UNEP), the textile sector ranks among the most environmentally demanding industries on a global scale. Challenges related to extensive supply chains, water consumption, and the use of chemical components complicate companies' efforts to maintain market positions while adhering to strict sustainability regulations.

These examples highlight how, even in a globalized and technology-driven context, the textile industry is undergoing a disruptive process, challenging established paradigms – as the emphasis on aesthetic aspects and the so-called "hand" of the fabric which consists in the sensation experienced when handling a fabric.

Therefore, the textile industry stands at a crossroads where tradition and innovation intersect. Understanding how these two facets can harmoniously coexist becomes essential. Successfully navigating the ever-changing industry landscape requires delving into the ways in which tradition and innovation may combine and impact one another, regardless of differences in raw materials, production methods, and application areas.

The research – The Industrial Marketing Perspective

In the current economic environment characterized by volatility and uncertainty, companies are compelled to continuously engage in innovation (Petricevic and Teece, 2019). This need promotes a thorough analysis of the textile industry, where innovation plays a crucial role in creating value and sustaining a competitive advantage. In addition to this, by navigating this intricate business environment, it becomes apparent that addressing these challenges goes beyond relying solely on in-house capabilities. The supply chain structure of the textile industry, which includes numerous actors globally, positions it as a sector not defined in isolation but as an integral part of an extensive network of relationships with other sectors which is alimented by a continuous exchange of resources, particularly knowledge. This sets the stage for the overarching research question that threads through the three studies comprising this research:

“How is the textile companies’ current innovation process intertwined with an effective and efficient relationships handling within business networks?”

Indeed, the journey towards innovation, while preserving tradition and excellence typical of the textile industry, emerges as a collaborative endeavor, where companies integrate into a broader network rather than existing as standalone entities. It is challenging to envision a traditional textile company undergoing a complete production turnaround and shifting its product focus to performance without the requisite technical expertise on elements that enhance fabric performance. According to the theoretical framework of this study, innovation involves an ongoing exchange of knowledge between businesses as an inherent aspect of their business activities. The concept that *“No business is an island”*² resonates within this research's conceptual framework, aligning seamlessly with the Industrial Marketing and Purchasing group's discourse. It underscores that a company's activities are not conducted in isolation but are intertwined with a broader social and business network.

² Håkansson, H. and Snehota, I. (1989), "No business is an island: The network concept of business strategy", *Scandinavian journal of management*, Vol. 5 No. 3, pp. 187-200.

In this study, the exploration of innovation and business relationships encompasses various perspectives, as depicted in Table 1. These include innovation within a business own offering system, sustainable innovation within buyer-seller relationships, and innovation between companies different in sizes.

Coming to the first topic, in the literature, the paradigm shift towards innovation closely ties with the transformation of traditional product-centric business models into customer-centric solutions highly responsive to individual customer needs (Kowalkowski et al., 2017). The shift from tangible products to intangible customer-based solutions represents a significant evolution in the way companies create and deliver value. Solutions now combine tangible and intangible elements, possessing the potential to create more value and solve problems than individual components (Andersson and Mattsson, 2015).

Despite the increasing emphasis on this transformation, a substantial research gap persists regarding the specific strategies and challenges faced by companies in redefining and innovating their offerings. This transition has profound effects not only within the company but also in the broader business network it operates in. According to business network literature, a company's strategic decisions and actions closely intertwine with changes in the business network (Snehota and Hakansson, 1995). As companies shift towards offering customized solutions to meet customer needs, the conventional boundaries between products and services blur, and the exchange of value becomes less deterministic (Prohl and Kleinaltenkamp, 2020). However, a fundamental and intriguing challenge arises as solution development resonates throughout the market, influencing not only customer value but also the dynamics of the market itself (Spencer and Cova, 2012). This intricate interplay between solution development, business network evolution, warrants further investigation.

Moreover, as anticipated in the previous section, sustainability emerges as a central concern in contemporary business contexts, and the application of the triple bottom line principle (Huang and Rust, 2022) necessitates exploration into how companies can integrate environmental, social, and economic sustainability into

their operations (Melander and Arvidsson, 2021). Sustainable strategies not only shape a company's approach to innovation but also exert a tangible influence on its performance and competitiveness (Jones et al., 2008).

The literature has focused on how innovation can be developed in the context of sustainability, requiring rigorous internal and network considerations.

It's also pertinent to reflect on the size of companies in the context of relationships. Although high levels of trust are often emphasized for companies to engage in a given relationship, this position may disadvantage actors with less established positions. Such actors, despite carrying innovations and knowledge not possessed by more established companies, may face challenges, particularly start-ups trying to establish collaborative relationships in highly competitive markets with significant barriers to entry (Ribeiro-Soriano and Piñeiro-Chousa, 2021). The early stages of start-ups often lack stable market positioning, resources, and established relationships, raising questions about how start-ups can evolve and benefit themselves and their partners by addressing these challenges.

Given these premises, this research, focusing on companies operating in the textile sector, aims to make an original contribution to existing literature. As shown in Table 1, the research is structured in three stages, each building on the previous one. The study unfolds sequentially, starting with an examination of the relationships between textile companies and the evolving commercial offer. It then delves into the evolution of sustainability innovation strategies within these companies and concludes with an exploration of the dimensional aspects of business relationships.

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Paper 1: Transforming the Business Offering from products to solutions. An inquiry into the textile industry				
Research Gap	Research Question	Th. Background	Empirical Context	Th. Contribution
-Understanding the implications of the core offering transformation on the structure and dynamics of business networks represents an unexplored area in current research.	<i>"What actually means for a business- to-business company to rethink its offering as a customer value solution and how this transformation is connected to changes in the company's supply network and its role in it"</i>	-Evolution of Business Exchange and Interaction Perspective -Market Dynamics in Solution Development: Snehota & Tunisini, 1993; Johanson & Mattsson, 1987, Hakansson & Snehota, 1995; Storbaka & Nenonen, 2012; Biggemann et al., 2013	-Longitudinal case study on four companies (EU sector): Gottifredi-Maffioli (IT), TFP (UK), Lenzing (GE) and Biseta (IT). -Comparison between traditional and technical textile industry	-Shifting from product to solution-based offering implies a progressive evolution based on three periods (Product-based, technology based and relationship based) -Transformation results in a complex supply network, convergence of skills and technologies, for the development of innovative solutions.
Paper 2: Supplier-customer relationships for sustainability-led innovation in the textile industry				
Research Gap	Research Question	Th. Background	Empirical Context	Th. Contribution
-An underexplored area in current research involves a detailed and empirical investigation into the mechanisms of sustainability-led innovation. -Understanding the specific impact of supplier-customer relationships on this innovation process remains unexamined	-RQ1: <i>How does sustainability-led innovation affect supplier-customer relationships in terms of emerging relational dynamics?</i> -RQ2: <i>How do supplier-customer relationships generate sustainability-led innovation?</i>	-Innovation in Supplier-customer relationship -S.I. in process product -S.I. in business markets Chesbrough, 2006, Andersson and Mattsson, 2015, Melander and Arvidsson, 2022, Aarikka- Stenroos et al., 2017, Waluszewski et al., 2004	-The paper is exploratory in nature (textile industry in Italy) -Reports on the results of in-depth, semi-structured interviews with entrepreneurs, managers, and experts in the textile industry.	-Enlargement of Business Relationships for Sustainability-led Innovation: -Expansion into New Markets -Selective Intervention and Supply Chain Commitment
Paper 3: Beyond Size: tracing the development of a Startup and Medium Sized Company Relationship and the influence on the business network				
Research Gap	Research Question	Th. Background	Empirical Context	Th. Contribution
-Participating the discourse of how buyer-seller relationships contribute to the entrepreneurial process and the specific role played by these relationships. -Challenges in buyer seller relationship between companies different in size are insufficiently explored.	-RQ1: <i>How does a relationship between customer and supplier-with distinct dimensional characteristics of the parties develop over time.?</i> -RQ2: <i>How does the development of the relationship impacts on the two companies' business network?</i>	-Discussion between network-related and entrepreneurship-related studies. -Resource Exchange -Trust and mutual adaptation shaping the interaction La Rocca and Snehota, 2014, Baraldi et al., 2020, Hakansson and Snehota, 2006 Tunisini and Bocconcelli, 2013, Aaboen et al., 2013	-Exploration through a longitudinal case study of two companies, one medium-to-large and one a startup. -Reda (medium-sized specialized high-quality fabrics) and Lanieri (startup specialized in custom-made men's suits).	-Collaboration brings growth and mutual benefits (Reda gains digitalization focus leveraging on its business solidity and Lanieri gains structured management leveraging on its innovative capabilities) -Access to each other's business networks for new opportunities.

Table 1: Structure of the research

The Methodological Approach

The research adopts a qualitative study approach in order to thoroughly analyze the intricate relational dynamics present in business networks, particularly in interactions with company representatives (Yin, 1994, Eisenhardt, 1989). Specifically, the utilization of the conceptual framework of Industrial Marketing & Purchasing favors a qualitative approach based on case studies, deemed especially suitable for capturing the subtle nuances of relationships among the actors involved in a network.

A pivotal component of the methodology is the longitudinal study method, enabling the monitoring of the phenomenon under investigation over time (Pettigrew, 1990). Through repeated interviews with the involved companies, a comprehensive understanding of the evolution of phenomena and the manifestations of actions within company strategies, along with their impact on relationships, was obtained.

To ensure profound information gathering and overcome the limitations of written communication, in-depth interviews were extensively employed. This approach proved crucial in surpassing the typical barriers of written text, fostering a dialogue that reduced information asymmetries and promoted a richer understanding of the internal dynamics of companies.

Moreover, the entire research path undertaken in this thesis embraced the systematic combining approach (Dubois and Gadde, 2014). This method, marked by constant adaptability to obtained results, aims for a general approximation to the truth. It was flexibly tailored to the specific characteristics of the involved companies and the information emerging from preliminary interviews, ensuring a dynamic approach aligning with the complexity of the analyzed company relationships.

In terms of empirical data collection, the research finds the Italian textile industry as a noteworthy empirical scenario, given its deep-rooted heritage and its significant contribution to the Italian economic landscape, boasting an annual turnover of approximately 25 billion euros. The industry's tenacity and

commitment to preserving traditional production methods underscore its economic importance. It is crucial to emphasize the profound connection between the textile industry and Italian production districts, which embody a distinctive approach of companies synonymous with “*Made in Italy*”. These districts, from wool and cashmere production in Biella to silk in Como and wool production in Prato, hold unique historical significance. They have not only nurtured closely interlinked supplier networks but also acted as incubators of specialized skills.

Understanding the inner mechanisms of the Italian textile industry unveils a sector adept at combining tradition and innovation, emphasizing the central role of different production areas as engines of constant growth and adaptability. Consequently, this research recognizes the Italian textile industry as an intriguing empirical subject that seamlessly fits into the broader narrative of innovation, tradition, and sustainability within the global textile industry.

A Three-Stage Study

Paper 1 – Transforming the business offering from product to solutions. An inquiry into the textile industry

The initial stage of this study concentrates on the transformation of traditional and technical textile companies' offerings, shifting from a focus primarily on products to a model centered around providing comprehensive solutions. In this context, the concept of the exchange object in an industrial marketing setting is explored, differentiating between a purely transactional approach and a relational one.

Existing literature underscores that interactions among involved parties serve as a value source due to the interdependence of actors within a network (Cantù et al., 2012; Schilling and Phelps, 2007). Numerous studies delve into customer solutions, value generation through interaction, and customer involvement in value co-creation (Baraldi et al., 2011; Ferreira et al., 2013; Jaakkola and Hakanen, 2013; Pressey and Qiu, 2007). This paradigm shift necessitates new organizational structures, capabilities, and mindset changes within companies. Solution development involves multiple actors collectively defining problems, creating

solutions, and generating value, occurring within solution networks comprising various actors, resources, and activities.

The study zeroes in on the European textile industry, categorizing it into traditional textiles and technical textiles, each with distinct market needs. Textile value chains are expansive, intricate, and often disordered, with overlapping roles and actors. Defining the roles of customers and suppliers can be complex. Additionally, many textile manufacturers are small or medium-sized enterprises that, in response to economic challenges, have specialized in technical or high-value textiles. These companies necessitate a customer-focused mindset, a high degree of interaction among actors, and the development of more complex and customized solutions.

The research methodology is grounded in multiple longitudinal case studies involving four companies: two Italian (Gottifredi-Maffioli and Biseta), one British (TFP), and one German (Lenzing). The study investigates the evolution of these companies' supply and supply networks over the last 15 years, drawing on various sources of information, including in-depth interviews and company reports shared over time.

This study underscores that the transition from product-centered to solution-based supply is fundamentally a relational phenomenon. It represents the convergence of expertise from various companies, even across different sectors, into a flexible platform fostering innovation and the satisfaction of customer needs.

Paper 2 – Supplier-customer relationship for sustainability-led innovation in the textile industry

This second article of the research delves into the analysis of relationship management concerning the adoption of sustainability in the business context and its implications for the network to which the company belongs. It places particular emphasis on the growing importance of sustainability-oriented innovation in the textile industry by closely examining the dynamics of supplier-customer relationships. The textile industry has undergone substantial transformations in recent decades, departing from traditional production methods to adapt to new

market dynamics and innovative processes. This paradigm shift is predominantly driven by the increasing demand for sustainable textile products, which, in turn, has heightened awareness of the environmental impact of industrial activities.

The study scrutinizes the role of supplier-customer relationships as a strategic source of sustainable innovation. Various perspectives on business innovation are explored, with the industrial economy approach standing out, distinguishing between supplier-dominated industries, production-intensive industries, and science-based industries. In supplier-dominated industries, innovation is primarily propelled by suppliers or other actors within the value chain, making supplier relationships pivotal sources of innovation (Aarikka-Stenroos et al., 2017; Brown et al., 2019; Chesbrough, 2006; Johnsen, 2009). Moreover, the open innovation approach has gained prominence, shifting the focus from innovation as a process within companies to one that actively involves suppliers and customers (Chesbrough, 2006; Eisenreich et al., 2021). Noteworthy contributions have been made on the participation of customers and suppliers in the innovation process and the role of inter-firm relationships (Athaide et al., 2018; Lee and Qualls, 2010; Makkonen and Johnston, 2014; Melander and Tell, 2019).

Innovation has become a key driver for the textile industry as it strives to balance tradition with the adoption of innovative products and processes to meet the growing demand for sustainability. The study acknowledges the considerable environmental impact of the sector and highlights the need for sustainability as a central objective for textile companies. Despite the extensive existing literature on sustainability and supplier-customer relationships, a gap persists concerning the relational dynamics of sustainable innovation in corporate marketing research.

To address this gap, the study adopts a methodology focused on in-depth interviews with experts in the textile industry, providing valuable insights into the dynamics of supplier-customer relationships and sustainable innovation in the textile industry. This approach is crucial for addressing the challenges of the textile industry in a changing business environment, offering flexibility beyond the constraints of a rigid questionnaire and facilitating the in-depth exploration of

dynamics that would be challenging to uncover through survey-based methods alone.

The study's contribution lies in the systematic analysis of sustainability requirements related to sustainable innovation in products and production processes. It enables an understanding of how production processes and products, although distinct, must be more closely aligned in terms of sustainability. Notably, the relationships between actors, particularly the customer-supplier relationship, are identified as essential drivers for innovation development and the alignment of production processes and products. This, in turn, has implications for the broader network, introducing new strategic actors possessing the necessary skills to advance corporate objectives.

Paper 3 – Beyond Size: tracing the development of a start-up and a medium sized Company Relationship and the influence on the business network.

The third and final study shifts its focus to exploring the dynamics of the relational process from an original and alternative perspective, specifically examining interactions between companies of different sizes, with a particular emphasis on the interaction between a medium-sized company and a start-up.

This study delves into the development of business relationships within the context of a business network, investigating how these relationships evolve from simple buyer-seller interactions to partnerships, irrespective of differences in the size of the involved firms. Specifically, it examines the evolution of a relationship between a start-up and a medium-sized textile company, assessing how this evolution impacts the broader business network within which both companies operate. Existing research acknowledges that start-ups and medium-sized companies possess distinct characteristics and resources. Start-ups are characterized by an entrepreneurial mindset and dynamic capabilities rooted in digital processes, while medium-sized companies have established resources, knowledge, and a solid market presence. However, start-ups, especially in highly competitive environments, may encounter difficulties in establishing relationships crucial to their success (Ribeiro-Soriano and Piñeiro-Chousa, 2021).

While the existing literature has explored how start-ups can engage with companies, the focus has predominantly been on how start-ups can grow in collaboration with medium-sized companies (Baraldi et al., 2020; Parry, 2020). Differences in size, corporate cultures, and competitive strategic goals present challenges but also mutual opportunities that can lead to the achievement of shared strategic goals (La Rocca et al., 2016). In line with this, the aim is to understand the complex nature of this interaction, identifying key factors influencing its growth and investigating mechanisms of resource interaction between companies of different sizes.

To address this challenge, the study adopts a longitudinal approach consisting of in-depth interviews conducted over a three-year period to comprehend the evolution of the relationship between start-ups and medium-sized companies during the period of their collaboration (Pettigrew, 1990). In this specific case, the study investigates the interaction between two textile companies, Reda and Lanieri. Reda, a medium-sized company, specializes in high-quality textiles for the fashion industry, while Lanieri, a start-up, focuses on made-to-measure men's suits with a strong emphasis on innovation and customization.

This study enhances understanding of how positive relationships can develop between entities of significantly different sizes. It underscores the importance of aligning the strategic objectives of both parties, bringing together the innovative drive of the smaller, dynamic company and the stability of the medium-sized enterprise.

Interwoven Innovation

This research, conducted through the examination of the supply network, sustainable innovation, and the investigation of relationships between companies of different sizes, has provided the opportunity to explore how these aspects follow a two-way dynamic with the networks to which these companies belong. A constant and reciprocal influence is observed, where companies' market strategies impact the network, and vice versa, the network influences companies' strategic choices. The original contribution of this research lies in the fact that the network to which

the companies belong acts as a propulsive environment for innovation. Companies, by pooling their specific competences, create a fertile ground - a dynamic platform - capable of developing tailor-made and co-developed solutions with the end customer.

For this to happen, a close relationship not only between customer and supplier but a broader alignment involving the entire business network is required. The supplier's vendor, for example, should demonstrate genuine and ongoing commitment to the innovation process required to develop the solution. In this case, skills become the fuel for the innovation flow within the network companies. The platform becomes an intangible space where different competences with equally different attributes converge, creating a dimension of continuous exchange from which innovation flows.

When considering the innovation process in terms of sustainability, a more systematic examination is demanded. Beyond aligning the objectives of companies collaborating in innovation, it is necessary to reflect on what constitutes sustainable innovation. This research emphasizes that for a product to be sustainable, its production process must also be sustainable. The production process should not only be perceived as the physical act of manufacturing but must include the intangible dynamics of research and development. Companies today constantly question themselves to meet current challenges, reconceptualize products ex ante, and dissolve established paradigms. This allows products to undergo a production process that not only increases economic efficiency but also aligns with sustainable goals.

In this innovative context, the importance of the relationship between customer and supplier becomes even more evident. Indeed, this relationship should be close and long-lasting, as attested by the literature. To effectively serve the innovative intent, it should reach an intensity transcending mere transactional exchanges and evolve into a partnership where the strategic goals of both parties are harmonized. This alignment ensures a smoother exchange of resources between the various actors, with a focus on competencies facilitating innovative initiatives for each

involved party. Research shows that these factors decisively influence network dynamics, altering the network's composition with the introduction of new actors and the reconfiguration of the roles and positions of each actor within the network.

In conclusion, going back to our initial research question – *“How the textile companies’ current innovation process is intertwined with an effective and efficient relationships handling within business networks”*– it is evident that relational dynamics, in which firms are inevitably engaged for their enduring existence in the market, serve as a fundamental source of innovation while maintaining and not disrupting certain traditional paradigms specific to firms. The coexistence of traditionality and innovation is possible when companies place a strong emphasis on the care of relationships and their continuous alignment in terms of business objectives.

Future research

This research conducted in the textile sector has highlighted the imperative for companies to foster networking capabilities, essential for sustaining an innovative strategy in response to the disruptive processes impacting the entire industry. Sustainability emerges as a predominant focus among various themes, necessitating a thorough examination of innovation strategies to achieve strategic objectives.

The research led to understand future field of study for examining how innovation strategies can intricately contribute to sustainable goals, particularly emphasizing circularity within production processes, becomes a critical aspect. The analysis of circularity, whether among companies within the same network or across different networks, presents a pivotal perspective for the evolving textile sector.

Concurrently, it the same line of thought it seem necessary to delve into the understanding of convergence and contamination between networks. This phenomenon opens new perspectives for integrating resources from diverse business context, synergistically combining efforts to tackle sustainability challenges. Interconnection and collaboration among companies, not limited to

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the textile sector but also extending through convergence with other sectors, emerge as key elements for the industry's future success.

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PAPER I

Transforming the Business Offering from products to solutions. An inquiry into the textile industry

Transforming the Business Offering from products to solutions. An inquiry into the textile industry³

Abstract

The paper studies and discusses business companies' transformation of their offering from product-based to solution-based and the connected changes in the companies' supply chains. Despite the extent of literature and the increased attention to the supplier's rethinking of its offering from well-defined and tangible to an a-priori indefinite and intangible one, research lacks in detailing what actually means for a company to shift from focusing its offering on a product to managing its core offering as a complex customer-based solution and how this impacts at the supply chain level. The empirical context of the research is represented by four companies of the textile industry and their supply chains. Multiple case study approach has been accompanied by a longitudinal analysis that have observed and analyzed the development of the four companies' offerings and supply chains in the latest 20 years and envision the present on-going changes. Our analysis shows that the new offering of the examined companies takes the form of a technological, knowledge-based, and relational application platform which is malleable and adaptable leveraging on a variety of supply chain contexts. That demands companies' abilities to acquire new roles and positions as linking nodes of suppliers and customers.

Keywords: *business offering, solutions, supply networks*

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1. Introduction

Since the beginning of the 21st century, literature on business-to-business marketing has faced the topic of rethinking a company's core business from being focused on selling stand-alone products and services to be focused on providing customer solutions (Ferreira et al., 2013; Paiola et al., 2013; Jacob & Ulaga, 2008; Helander & Moller, 2007;). The latter are defined as customized and integrated bundle of goods and services capable to meet customer needs and provide solutions to their problems (Sawney, 2006). The concept of solution recalls an offering that is not defined a-priori by the supplier company, but it is generated through the interaction relationship with the customer (Tuli et al., 2007; La Rocca et al., 2016).

Despite the extent of literature and the increased attention to the supplier's rethinking of its offering from well-defined and tangible to an a-priori indefinite and intangible one, some authors observe that research lacks a detailed exploration of what actually means for a company to shift from focusing its offering on a product to managing its core offering as a complex customer-based solution and how this impacts at the business network level (Kowalkowski et al., 2017). As scholars have suggested, there is the need for further research on the nature of shifting to solution processes and on in-depth understanding of how customer solutions and relations evolve beyond the single customer-supplier dyadic relationship (Spencer & Cova, 2012; Biggemann et al., 2013).

Through our analysis we thus want to enter into depth in the comprehension of what actually means for a business-to-business company to transform its core offering from product-based to customer solution-based. Secondly, we want to study how such a transformation of the core offering is connected to changes in the structure and dynamics of the company's business network and to a new role and position of the company in it.

As discussed by the business network literature, that we take as point of reference in this paper, it exists a strong interplay between a company's strategic decision-making

ad action and changes in its business network context (Hakansson & Snehota, 1995). This occurs because a company' strategy always takes place within a framework of business network relationships (Baraldi et al., 1999). In fact, on the one side, the single company strategy to achieve single goals and objectives generate changes in the network and the company's own position in it because of the interactions and interdependences; on the other side, these interactions, and interdependences as well as other network actors' re-actions and interactions affect the single company's role and positioning (Ford & Hakansson, 2006). We thus focus on the connection between the changes in a company's offering into customer solutions and the changes in the company's supply network.

The empirical context of our research is represented by companies of the textile industry and their supply networks which are characterized by a high level of complexity and dynamism at global level (Guercini & Runfola, 2004; Guercini, 2008). The research has thus been conducted on the transformation of the core offering of four European companies of the industry and on the connected transformation of their supply networks. Multiple case study approach has been accompanied by a longitudinal analysis that have observed and analyzed the development of the four companies' offerings and supply networks in the latest 15 years and envision the on-going changes from now to 2030.

Our analysis shows that the new offering of the examined companies and what can be conceptually defined as solution takes the form of a technological, knowledge-based, and relational application platform which is malleable and adaptable in different contexts of business relationships and supply chains. This transformation of the companies' core offering impacts on the structure and dynamics of the company's supply networks where our focal companies under analysis assume new roles and positions as linking nodes of suppliers, business customers and final consumers.

The paper is organized as follows: Section 2 reports the theoretical background of the research; Section 3 describes the empirical setting – the European textile industry and the four companies under analysis – and the methodology; Section 4 describes and

discusses the results of the research; Section 5 develops theoretical and managerial conclusions.

2. Theoretical Background

One of the first relevant challenging issues that have been carried out by the business marketing literature when contrasting the orthodox marketing approach has been the discussion about the “object” of the business exchange in the market (Snehota & Tunisini, 1993; Johanson & Mattsson, 1987). It has been observed that this “object”, in the most of the cases a product, is substantially “given” in the transactional orthodox approach while empirical evidence proves that it is the result of the exchange interaction in the relationship approach (Waluszewski et al., 2004). The variety and variability of the substance of the exchange is one of the main assumptions that has guided the interaction perspective to business-to-business exchange relationship in business network contexts (Hakansson & Snehota, 1995). Indeed, interactions and interdependences within the business networks are value-creating processes (Hakansson & Snehota, 2017).

In the last two decades this radical change of perspective has been assumed as being the one capable to depict the reality of the business exchange processes occurring in business markets. In particular, a stream of literature has addressed its interest of research on the development of customer value solutions as result of the business-to-business interaction (Aarikka et al., 2011), entering the analysis of solution processes and needed operational and marketing capabilities (Storbacka, 2011), forms of value co-creation (Frow et al., 2015), new business models (Storbacka et al., 2013) and returns and performance coming from solutions (Worm et al., 2017).

A huge number of studies have been developed concerning the empirical evidence and the discussion on customer solutions (Vargo & Lusch, 2004; Anderson et al., 2006; Tuli et al. 2007; Cova & Salle, 2008), generating value in business exchange interaction (Ulaga & Eggert, 2006; Payne et al., 2008) and involving the customer in the value co-creation process (Ferrerira et al., 2017; Biggemann et al. 2013; Hakanen,

2012), demanding the supplier's new organizational forms, capabilities and conventional way of thinking (Windhal & Lakemond, 2010; Davies et al., 2006).

Conceptually when a Company shifts the focus of its market strategy from based on products to be based on solutions shaped according to the customer's needs, the object of the business exchange between the company and its clients becomes undetermined and related to the use values needed by the client (Prohl et al., 2020). Solutions thus take the form of bundle of tangible and intangible elements customized according to customer needs (Andersson & Mattsson, 2015). Such solutions are considered to offer greater potential for value creation and problem solving than the individual components would have alone.

A critical and intriguing issue is that a situation of solution development does not develop in a buyer-seller dyadic 'island', i.e., it is not isolated from the 'rest' of the market" (Spencer & Cova, 2012). In other words, solution effects are not limited to customer value outcomes but also may influence other market actors and even shape the market. Solutions development is considered a process of co-creation involving multiple actors, who indeed veritably shape, and are themselves in return shaped by, the markets and the networks that they engage in (Storbaka & Nenonen, 2012). Biggemann et al. (2013), in studying the process for developing and implementing customer solutions and its effects, stress the real-world involvement of multiple parties who co-define the problem, co-develop the solution, and, effectively, co-create value. Solution development thus occurs in the interplay of actors, resources, and activities in solution networks (Jaakkola & Hakanen, 2013). Furthermore, literature stresses that the solution provider's ability to create, maintain and develop its supplier network is a critical capability (Huikkola & Kohtamäki, 2017) as the supply network is the context in which the solution development takes place. We can thus say that the process of transformation of a company's offering in a customer value solution is tightly interconnected to the context of interactions and interdependences of the company's supply network.

Our research enters into depth in the comprehension of what actually means for a business- to-business company to rethink its offering as a customer value solution and

how this transformation is connected to changes in the company's supply network and its role in it. Based on its connection with other actors in the supply network, each actor occupies a certain position that also determines the actor's ability to get access to others' resources and influence the network (Abrahansen et al, 2012). Strategizing in networks is a question of maneuvering roles and positions (Nystrom et al., 2017) by leveraging on resource ties, actor bonds and activity links. By transforming its core offering into a customer value solution we observe how the company expands the boundaries of its supply network and contemporarily becomes an integrating actor capable to enact new supply network dynamics and play a new role in the supply network context.

3. The empirical setting and research methodology

3.1 The European textile industry

Our analysis refers to small, mid-sized and large companies of the textile industry. The textile market is universally considered as composed by two industries (sectors): the so-called traditional textiles, which concerns the clothing and furnishing application fields, and the so-called technical textiles, which regards industrial application fields. While for the traditional textiles, the main features of the products have to do with both material aspects, such as thermal properties, and immaterial aspects like appearance and touch, the technical textiles are evaluated merely or mainly for their technical performances. With performance we mean a set of characteristics which may vary from application to application and involves tenacity, elongation, shrinkage, resistance to continuous effort, fire, temperature, light, humidity, chemical substances, etc., in other words a specific capability of a product to accomplish a specific function of use.

While the market for traditional textiles has a clear structure with demand concentrated in a few, historically well-known, application types and is frequently driven by brands of various nature, from the retailers' to the designers' brands, the market for technical textiles is very fragmented, products are sold to an extremely wide and expanding variety of final markets, from the building to the car industry,

from the protection to the filtration market, from the geotextiles to the aerospace products, just to make a few examples. In both markets customers can be of various sizes. In the traditional textiles market customers' knowledge is mainly on the consumer markets with a deep understanding of fashion trends, consumer needs and tastes, but without a specific competence of the textile technology and the raw materials. Customers of technical textiles, on the other side, have a deep knowledge of the applications, the technology, and the technological trends. The production of traditional textiles which represented for a couple of centuries one of the main industrial sectors in Europe has mainly moved to the emerging Asian countries and is now based in the Far East and central Asia. As far as the technical (or industrial) textiles is concerned, Europe is still by far the leading producing area worldwide.

The actors of the whole supply chain and especially those upstream in the chain have mainly shut-down their original plants or abandoned Europe to move to cheaper countries. This is particularly true for the producers of fibers and yarns, the raw materials which represent the basis of any fabric and therefore feed the entire supply chain. Both the producers of natural fibers, such as cotton, wool, linen and the producers of artificial fibers and yarns, such as viscose, polyester, polyamide and so on have moved to emerging countries where labor costs are much lower, the demand is booming and there is an extremely high concentration of players and facilities with up-to-date technologies. As a result, nowadays, European share of technical fiber production is extremely limited or even not significant, being well under 5% of the worldwide capacity. Even innovation is driven by Asian companies, mainly Japanese and Korean.

The market for textiles in general is very well known for its extremely long, complex, and chaotic value chain with a lot of overlapping of roles and actors. As a result, the definition of customer and supplier can be quite complicated and often companies can be better defined as just partners. Producers of textiles are mainly small or medium size companies, while some big players are also to be found in the sector. The European textile industry in general has seen a huge reduction of employees in the last 15 years (in Italy the sector has lost approx. the

40% of the working force). Due to this crisis many historical companies have looked for a more protected corner and for higher margins and have therefore converted their production either to very high value, fashion orientated fabrics or to technical textiles. Both are definitely market driven applications with high customization, creativity, and significant innovation content, in which creativity together with technical competence is the main skill needed for long term success, along with a comprehensive knowledge of the ingredients available (raw material), of the transformation processes and of the respective sources. While in the high-end fashion market creativity and technical competence are devoted to the development of esthetics and comfort, in the technical textiles the main objective is to increase product performances and introduce innovations needed to substitute traditional materials like metal. Even if the goal of the activity may be different, one being more focused on immaterial contents and the other on technical performances, the strategic approach is quite similar.

Compared to traditional mass production of clothing and home textiles, both the new areas require significant adaptation and a deep change of mentality. Both require a customer centric approach; customers look more for solution providers than for just physical products and the level of interaction is extremely high. The solution development phase is in both cases much more complex than it was before. Developing fashion solutions include an extremely intense interaction with the customer and a deep understanding of their mentality, corporate identity, culture, and goals. Furthermore, mere performance aspects are now to be introduced into fashion items, requiring competences which are not considered as part of the traditional knowledge of the industry. On the other side, developing new technical textile solutions can take quite long time and companies coming from the traditional textile sector are normally surprised to see that in the technical textile sector a few years can be easily needed to finalize NPD processes. In both cases a deep understanding of the customers' needs (expressed and not expressed, conscious and unconscious) is absolutely crucial to develop the right solutions and build up a long lasting and mutually satisfactory relationships.

As mentioned above, during the last years more and more companies have tried to abandon the traditional market of traditional textiles and have moved partly or entirely towards high fashion and technical textiles. As a result, in both areas competition has significantly increased. Where volumes and logistic allowed, also imports from the Far East and other developing countries has begun to develop. As a result of the increased competition, margins, and volumes accessible decreased. Even in the new areas, the most traditional business models, concentrated on costs, volumes and standardization of the products have shown to be unsuccessful and have almost regularly led to the death of the producers of technical textiles. Quite often even high quality has been not enough to escape from the hard competition. Some companies have specialized in developing customized products with a kind of boutique attitude strengthening and protecting the relationships with their account and developing a specific knowledge on the final market and the final applications. In order to follow their customers and their needs these companies have used their competence both on processes and products, adapting their technologies, their raw-materials (with the support of their suppliers) and processes to better meet customers' expectations and needs. Thanks to this strategy these companies have built up the most stable success and the best economic performance, even during the crisis period.

In these new market areas being customer-centric means considering the customer as a necessary source of continuous inspiration and never consider the company's offer, both in terms of products and technology, as a rigid system that can never be changed or even adapted to the request of the market. The focus on the traditional textile physical products has been replaced by investments in the development of a technology set (which includes the network of relationships with the suppliers of both the machines and the material) and competences that have a specific value only if they can be shaped and used to make the customer more satisfied and the customer processes more efficient, thus strengthening and making the supplier-customer relationship stronger.

With regard to the above transformation in the textile industry our goal is to enter into depth in the comprehension of what actually means for a business-to-business company of the industry to rethink its offering as a customer value solution and how this transition of the offering from products to solutions implies changes within the company's supply network and its role in it.

3.2 Methodology

Our goal is to get insights from the empirical setting to discuss what means to transform a company's offering from a product to a solution, leveraging on effective networking strategies. We have adopted a longitudinal multiple case studies approach. The four companies which represent the empirical setting of our analysis are four: two Italian companies (Gottifredi-Maffioli -GM and Biseta), one British company (TFP) and one German Company (Lenzing). The reasons why we have chosen these four companies are:

- All are relevant players in their industry which have been capable to face the changing business context with rapid and effective transformation of their core business and networks.
- Despite the different company size, they have followed similar paths towards long lasting success.
- They are active in various textile areas in terms of position in the supply chain, technology, customer characteristics and final markets. Lenzing and Biseta are more connected to the so-called traditional textiles, while TFP and Gottifredi Maffioli work in the technical textiles business.
- They represent different business cultures and business areas in Europe.

Gottifredi Maffioli Spa is an Italian company which was founded in 1926. It is a small family-owned company with a turnover of approx. 10 million euros and 50 employees. The company was born as a twister/braider of textile yarns for industrial applications. During the years they have been active in many different businesses, such as threads for textile machines (Jacquard), sewing threads, twisted yarns for fishing nets and so on. While they have been the first in the world to realize a synthetic climbing rope (for the Italian expedition on K2, 1954) they have

not regularly produced ropes until 1982. Since then, they have developed and produced top-performing sailing ropes especially used in top level competitions (America Cup, Volvo Ocean Race, etc.). Nowadays they are generally considered as the leading company of the sector in terms of innovation and performance and supply the most important sailing teams in the world. In the last few years Gottifredi Maffioli has strengthened its position as supplier of the mega-yacht (luxury) producers.

TFP Ltd. is part of the James Cropper Group, a historical paper mill which is quoted at the London stock exchange. Despite its paper origins, TFP is a producer of highly innovative wet-laid nonwovens realized with the most performing textile fibres. Thanks to a well-known process, generally considered quite superseded in many application fields, which TFP has developed to its maximum potentialities, their products are used in some of the most demanding application fields, such as aerospace, car industry (sport cars), yachting and many other applications of high technological content. James Cropper 2019 turnover is around 104 million pounds, with TFP representing more than one fourth of the total turnover (29 million £), with an outstanding net profit of 11£.

Lenzing AG is one the few historical European producers of fibers which is still alive and very successful. It is a huge group very well-known as world leader of cellulose fibers with approximately 6.000 employees and a turnover of round 2 billion €. During the recent years Lenzing has become the name for sustainability in the textile world with some of its brands which are considered as benchmark in this respect, such as Tencel and Modal.

Biseta is a small family-owned weaving company founded at the beginning of the 80s, specialized in the production of Jacquard and tweed fabrics. Nowadays the company has approx. 50 employees and a turnover of roughly. They are suppliers of some of the most famous fashion brands, such as Chanel, Etro, Armani, Zegna, Missoni, Alexander McQueen, Stella McCartney, and many others. They provide these famous customers with design, process and products which satisfy their sophisticated and quickly changing needs.

The research methodology is based on qualitative research following the longitudinal multiple case-study approach. Longitudinal studies employ continuous or repeated measures to follow actors over prolonged periods of time—often years or decades. This methodology is particularly suitable when dealing with research questions that try to identify some behavioral aspects of companies' actions (Eisenhardt, 1989; Yin, 1994), within a research project based on tracking change processes and envisioning exploratory paths. Longitudinal approach to case study development, allows examination of complex processes followed by firms (Melin, 1992) and highlights change over time in specific variables and their effect (Pettigrew, 1997). This approach best addresses the main objective of the paper that is to investigate the transformation of companies' core offering and business networks. We have developed a longitudinal analysis that have observed and analyzed the development of the companies' offerings and business networks in the latest 15 years. Multiple sources of information have been used. In particular, we have:

- carried out approximately 3 per year semi-structured personal interviews in each company with different people having different roles in the companies, top managers, and owners in particular; These actors are the same participants followed – even if on different positions in the company - over the full time period of 15 years.
- taken part in several companies' internal seminars and workshops as well as our own workshops organized with the companies' managers and the Italian technical textile association (Textechclub);
- visited the companies' plants and headquarters at least 5 times each of them over the course of the 15 years
- read numerous company documents.
- supervised three master thesis and coordinated five field projects committed by the analysed companies aimed at supporting their business development process.

For the specific purpose of this study, from September 2020 to January 2021 we performed 14 specific in-depth interviews to gather more detailed and updated data, especially those concerning the companies’ expectations of future changes in their business from end 2010 to 2025. Moreover, we have asked our respondents to comment on the summary and the interpretation of the data collected in the previous interviews. While conducting personal interviews we sought to collect the opinions of various individuals in the company.

We sought data triangulation by gathering the same piece of information from the different sources (semi-structured interviews, internal documents, and direct observations). Each time, the interviews were transcribed for the analysis. Elements progressively emerged to “compose” the case in a dynamic perspective. Table 1 provides the list of the selected companies and the interviews performed in each of them.

Company Name	Interviews’ respondents	Secondary data
Gottifredi Maffioli	Owner/CEO	Interviews and informal talks to customers, competitors, and product users
	Marketing Director	
	Sales Manager	
	Production Manager	
	Technical Director	
TFP	CEO	Interviews and informal talks to customers, competitors, and market experts
	Technical Director	
	Sales and Marketing Director	
	Product Managers	
Lenzing	CEO	Interviews and informal talks to customers, competitors, and brands
	Marketing Directors	
	Project Managers	
	Technical Managers	
BiSeta	Owner	Interviews and informal talks to customers, competitors, and market experts
	Sales Manager	
	Technical Manager	

Table 1: *List of selected companies and interviews performed*

4. Results

4.1 From products to solutions

The research we have carried out highlights the transformation process of the offer of the companies analyzed during a time window of 30 years. In particular, we have identified three time periods, each characterized by specific features of the companies' offerings. These three different periods can then be distinguished as being characterized by the occurrence of a particular event that had a huge impact on the companies in the sector. The first, China's entry into the WTO (2001), the second the financial crisis of 2008-2009 and the third the recent massive diffusion of digital technologies.

In the paragraph we examine in detail the specific characteristics of each phase that has been identified and contextually report on the changes that have affected the offering of the four companies under analysis.

We can start considering that till the latest decades of the XX century, the typical strategies concerning the offering in most of the European companies of the textile industry are more or less based on the physical product with the addition of a few pre- and post- sales service. At the beginning of the new millennium, that approximately depicts the first time period we have observed, the structure of the textile markets begins to change dramatically. New investments are installed in Asia and competing products with good quality (but normally poor service) are imported in Europe. As a response, the successful European players contrast the aggressive competition on the product conducted by the Asian companies by introducing some kind of differentiation in the products also by leveraging on new production processes. The differentiation is based on the idea of serving more effectively the specific needs of each target customers.

In particular, Gottifredi Maffioli more and more personalizes its ropes and braids continuously introducing new super technical yarns and adapting the structure of the ropes to the needs of the customers. TFP, as new start-up of the James Cropper Group, begins to develop its very innovative products and

develops new materials in close connection with the customers. Main activity of the James Cropper Group is still the production of paper, a field in which product quality and scale play a very important role. Nevertheless, adaptability of the products to the customers' requests, thanks to the flexible and exclusive process, becomes the core capability of TFP.

At the beginning of the new millennium Lenzing is already the world leader of cellulosic fibers and dominates the market. Nevertheless, already begins to invest on special products and also starts to face the challenges of sustainability. Biseta, producers of standardized jacquard fabrics for the medium-high end of the market, begins to supply its customers with personalization. Even if the product is always raw, the structure of the fabric follows the needs of the customers making the steps downwards in the supply chain easier and more efficient.

With the crisis of 2008 and 2009 we identify a second time period that put new challenges to the companies. The competition rate becomes even higher. The increased availability of alternative materials at every level of the supply chain requires a modified and more cooperative approach. The immaterial component of the offering becomes progressively enriched and the relationship between actors of the textile supply chain became key to survive and be successful. Deeper adaptation processes are required among the actors of the textile supply chain. While in the first period we have observed companies' efforts were oriented to provide adaptations to customers' needs by improving the characteristics of the product or its production process, in this second period investments are requested to provide greater innovation the technology underlying the product. This demands companies to involve and interact more in depth at the technological level both with customers and with suppliers to improve the innovation processes. By the technological and innovative improvements of the product the goal is to follow the customers in their strategical needs to allow them to be competitive and to strengthen their market position. As we shall highlight later, in this period, the management of

cooperative relationships for innovation within the supply chain, both upstream and downstream, becomes the key factor to build up a competitive advantage. Going back to our examples, Gottifredi Maffioli strengthens the relationship with its customers and key suppliers investing in new processes and capabilities. The offering becomes enriched with advice and consultancy of the more innovative and technological product. Moreover, customers are allowed to organize test runs directly at the GM laboratory and factory becoming directly involved in the value creation process.

TFP follows the same path. The original wet-laid machine becomes integrated with lamination and post-treatment facilities. A test unit is introduced in a separate area to allow customers to organize their test runs directly at TFP, also taking advantage from the labs. Long term contracts are closed for developing long term joint projects with customers and suppliers in new technological areas.

Lenzing invests towards new strong sustainability-oriented brands and, thanks to its connections along the supply chain, especially downstream, begins to offer branded solutions to the well-known fashion brands in the field of traditional textiles and technical leader in the area of technical textiles, involving many actors of the supply chain. Moreover, the technology is continuously adapted to meet the needs of the customers and of new applications.

Biseta begins to move from the raw jacquard fabrics to the design and the production of finished jacquard fabrics with a very high content of competence and mixing industrial approach and craftsman competence. By doing this Biseta becomes one of the most strategic partners of the most famous brands of the fashion business worldwide. The relationship with this brand requires a deep understanding of the brand identity and culture of the fashion brand as well as outstanding competence and creativity both on the designing and on the weaving technology. As a matter of fact, the technology is continuously adapted and integrated with new automatic and manual processes.

In the third time period, characterized by the new technologies and the in-progress business transformation due to the fourth industrial revolution, customer's requests and needs are addressed to more high-performance and technologically advanced products, that fit as closely as possible with their new business models and very specific requirements. We observe a growing need for new products and requirements that imply the introduction of new capabilities and decision-making processes in business contexts. The offering to customers goes beyond innovative and technologically advanced products. Customers demand a full support to the growth of their business and to maintain and improve their competitive positioning in the market.

Gottifredi Maffioli thus integrates its textile competences with other sophisticated technologies and adding problem solving characteristics to its final products. The ropes are integrated with new functionalities which include sensing, data transmission, structural performances and are addressed both to the yachting and sailing industries and to the building industry. To develop the required performances to support the customers, GM activates new relationships with actors of different industries and supply chains, never contacted before, whose competence and technologies are fundamental to provide the final customer with new solutions.

By further improving its product technologies, TFP enters new markets in which its products can accomplish completely unexpected new functions. A concrete example is the market of the fuel cells, in which a specific TFP product can be used as a component, once coated with high value technical metals. Fuel cells represent an area of very advanced technology which needs a precise and sophisticated knowledge. To appropriate of the necessary know-how and technologies TFP acquires a fuel cells producer thus entering in a new supply network and know-how and competences.

As concerns Lenzing, whose distinctive capabilities are associated with sustainable fibers, the company understands that supplying only sustainable raw materials is not enough if the fabric producers are not backed to switch to the

new sustainable products. Furthermore, raw-materials and processes can be not enough to develop finished products which can be perceived as sustainable. In order to meet the demand of sustainability, weavers, knitters, garment makers and brands need a solution which allows them to become certified members of a sustainable supply-chain. Lenzing supports customers to transform their sustainable raw materials into sustainable fabrics and clothes providing them with the historical background, the sustainability culture, the textile competence but also with the needed technical support provided directly or through their very wide network partners. Thus, Tencel® and Modal® from being brands related only to specific fibers have almost become brands that have an inherent story of sustainability which relies on a network that can integrate (give access) the customers willing to enter the world of sustainability. Biseta, on its part, changes its activity from supplier of personalized fabrics into supplier of fashion creations. This involves not only the design of the fabric which is developed thanks to a deep understanding of the brand image of their customers but also a strong competence in the weaving technology and process. The company improved not only its creativity, technological and process competences, but also sophisticated marketing competences. To manage these activities the set of competences becomes much wider and more sophisticated, involving immaterial aspects (fashion creation) and a much wider network of relationships with relevant players inside the network. The company accompanies a process in which new features and performance are required to the fabrics, referred both to the technical industries and to the traditional clothing and home textiles. Designing and realizing this kind of products requires a wider set of competence than the traditional fabrics. Therefore, Biseta further widen its set of relationships integrating new technological actors also of different supply chains.

To summarize the results of the analysis, the companies under our analysis have progressively moved the focus of their activity from a material and a more or less standardized product - to be incorporated into a usable product by a specific target

market - to innovative, flexible, basic technologies adapted to different application needs by different type of customers. In other words, while during the first period the focus was on a given production process and the output was adapted within its technical limits, since the second period the R&D investments and the more intensive interaction with customers and suppliers have gradually transformed the offering of the companies into a technological set that can be shaped according to the customer and its concrete applications.

In particular, as summarized in table 2, the first temporal phase is characterized by the need for European textile companies to react quickly to aggressive competition from new entrants from Far Eastern countries - China in particular. This phase is characterized by the primary attention of companies to the qualitative and quantitative elements of their tangible offer - the physical product and the production process - to be supplied to different industrial segments with similar technical requirements and the search for the most efficient and effective economic and functional value. European companies are mostly challenged to increase their focus on product and production quality to differentiate from mass market competitors in the Far East. Moreover, they are required to implement more sophisticated segmentation of their traditional industrial segments, and growing investment in process efficiency to lower costs where possible. Given this situation, we name the companies' offering in this period as "product/process based".

In the second temporal phase, companies carry out a major adjustment in their business perspective due to the global economic crisis and the reduction of the quality gap between European and Far Eastern production. Characterized by the improvement and eventual adaptation of textile technologies (spinning, weaving, knitting), the goal is to reach a variety of different industries and customers by making the textile product a perfect substitute for other materials such as plastic or metal. Companies invest in innovation and new technologies, involving customers and suppliers of the supply chain and transform their offerings into a malleable technological product capable of being adapted to a variety of technical, functional, and sometimes aesthetic needs of different industry segments and

specific customers. As a matter of fact, we name the companies’ offering in this period as “technology based”.

Lastly, the third temporal phase, currently underway, is marked as a time horizon in which companies are considering further necessary business development radically and generally based on digitalization and sustainability. In particular, companies aim to revise the offering so that it becomes a technological and relational setting malleable and adaptable in supporting the development of the customer's business in different market contexts. Companies leverage on a variety of business interactions and relationships with customers, suppliers, and other actors of different technological and industrial supply chains to support the customers in the development of their business. We name the companies’ offering in this period as “Relationship based”.

Company	Period 1 Offering Product/process-based	Period 2 Offering Technology-based phase	Period 3 Offering Relationship-based
GM	Sewing thread, yarns and braids for industrial applications and innovative racing sailing ropes with top performances.	Customized racing sailing ropes with top performances and Sailing ropes for the yachting industry.	Customer-based development of functionalized braids and ropes.
TFP	Wetlaid nonwovens for technical applications	Wetlaid application based on non-wovens for technical applications	Customer based wetlaid non-wovens for innovation-intensive markets.
LENZING	Viscose/special cellulosic fibres	Branded sustainable cellulosic materials	Sustainability competence/branding and network/product solutions (For technical and non-technical application)
BISETA	Range of standard raw Jacquard fabrics (to be personalized for customers)	Personalized Jacquard fabrics for season collections	Concept co-development, designing of season collections and production of Jacquard fabrics

Table 2: *Changes in the core business of the analysed companies*

The current trend which will develop during the coming decade represents an extension of what happened during the latter. The analyzed companies are beginning to adapt their offering, according to their set of competences, to the demand without any limit of technology and activity as their knowledge, technologies and abilities are increasingly combined and integrated with those of other actors, also of different business and technological fields depending by the specific customers' use functions and business goals.

4.2 Changes in supply networks and networking

As discussed at length in the previous section, it can be seen in all three phases that the companies, although different in terms of size, processes, and location of production activity, implement a strategy characterized by a single common thread: the evolution of the offering from based on products to based on integrated malleable solutions with and for customers. However, it is essential to emphasize that this process of transformation of the companies' offering is strictly interlinked with a change in the companies' supply chains.

As a matter of fact, during the first and second time period, Gottifredi Maffioli follows the customer needs to the extreme borders of the textile performances. Thus, the textile characteristics of the ropes are stretched to the maximum of their possibility, thanks to the deep and exclusive technical knowledge of the raw materials available and to the unique competence in the rope production processes. At the same time TFP tries to explore every possible application corner of its technical non-wovens, using and developing innovative fibers and adapting the processes. As a result, many new functionalities of its non-wovens, including conductivity and active fire reaction are added to the product range. Lenzing develops a wide range of sustainable technologies for different applications and finished products, strongly working on developing a fully sustainable production process, from the raw material (the cellulose) to the spinning process. Biseta moves for the raw fabrics to the customized fabrics, exploiting the extreme flexibility attitude of the Jacquard technology which allows to customize the product to a level which is close to the embroidery. Its fabrics are now impacting

on all the senses. Its technology supported by a unique competence can satisfy every need and fulfill any specific customer requirement. To support the evolution of the companies' products and technologies, the companies' suppliers, and customers and, in general, supply chain interactions for innovations are fundamental.

The situation still further evolves, during third time frame, when Gottifredi Maffioli starts to offer products that can fulfill other needs rather than the traditional, physical performance a textile product can provide. Thus, the modern ropes integrate new functions and just to make a few examples, can conduct electricity and light and, combined with ICT components, can generate (working as sensors) and transfer information. TFP makes technical high-value non-wovens with non-typical textile properties such as conductivity and active fire protection. In order to better serve the customers of specific market areas and to play a more significant role, TFP extends its competences. For example, in the field of conductivity, which is crucial in highly developing markets - such as that of the fuel cells and electrolyzers - TFP extends its offering to the supply of coating treatments which significantly improve conductivity of non-wovens but is also applied to many other components of the above-mentioned products. The company becomes an expert in conductivity and a provider of conductivity fibers to the market of fuel cells and electrolyzers. Lenzing integrates the production of sustainable fibers with the coordination and the supervision of the whole supply chain actors and new supply chains' actors to provide the new customers of the fashion brands with certified fully sustainable fabrics. Biseta makes excellent fabrics whose sensorial value is only one of the aspects of a fashion creation, where immaterial contents by far overtake the material ones. To do this Biseta focuses on the design of their fabric, inspiring new product concepts which translate their customers' brands values into material products. Thanks to the flexibility of the Jacquard looms, the weaving technology becomes therefore just a platform which can be adapted, integrated, and transformed to give material appearance to the different brand images which are developed by Biseta.

What we observe is that the transformation of the companies' offering is connected to changes in their supply chains.

To better understand the dynamic evolution of the supply chains of the investigated firms, we suggest an interpretative framework based on two variables and reported in figure 1: we name the first variable "technological environment"-namely the technologies on which the product and the production processes are based; the second variable is the "function of use" refers to the use for which the company's product is manufactured and the actual purpose for which it is intended. Each product mainly has its own nature, characteristics and technical properties which are defined according to the applications for which it is designed and performs a specific function to which users attribute value.

In the first two periods, technologies applied and incorporated in the companies' products are related to the traditional technological environment and strictly to the traditional use function of the companies' products. Moving to the third period, the customers demand new and more complex use functions to the companies' products, and this is connected to a change in the technologies converging to the companies' offering that become multiple, differentiated, and integrated. These technologies derive from a variety of suppliers and partners coming from different industries thus determining a complex supply network.

In particular, illustrating figure 1, in the first period the relationships between our focal companies (F), the suppliers (S) and the customers (C) are embedded in the same business industry, with the aim of specializing in certain customer needs. In this context, therefore, the technological basis remains the same. As far as the second phase is concerned, there is instead the development of a more specialized and customized offerings that responds to new use functions and open up to new markets. As a matter of fact, During the second phase companies, for customization purposes, start to adapt their products to the needs of customers in order to achieve partially changed functions of use. As a graphical representation, Figure 1(b) shows changes in the companies'

downstream part of the supply chain where it is possible to find other companies that are part of the same technological environment but that is looking for a new function of use of the product.

Lastly, In the third period our focal companies (F) realize the strategic necessity of reaching a very close relationship with the customer in order to ensure that the offering expands its use function and leverages on a variety of different technologies. In this sense, the Focal Company (F) to develop new solutions not included in its existing product portfolio, also binds itself at a higher level in the value chain with new actors belonging to distant technological environments thus obtaining competences and knowledge that allow it to develop new, more and more advanced solutions. On the upstream side, the company (F) activates and relates to a variety of suppliers and partners who own a variety of different technologies to support the clients in the transformation of their business. The company's offering gradually becomes a "platform" where this process of convergence of skills and technologies comes to life and from which ad hoc solutions perfectly reflecting the needs of customers are developed. Our focal companies thus open up their networks to interact with new players, creating a new fertile ground for the acquisition of new capabilities that will contribute to the effective deployment of enriched and innovative use functions. An example is the introduction of sensors and electronics between the weft and warp of the fabric. New possibilities are thus arising in which, alongside the demand of a technologically advanced and high-performance product/solution, science, technological disciplines, and tradition intersect, leading to the development of new inter-organizational relationships in supply network contexts for the effective implementation of innovative solutions.

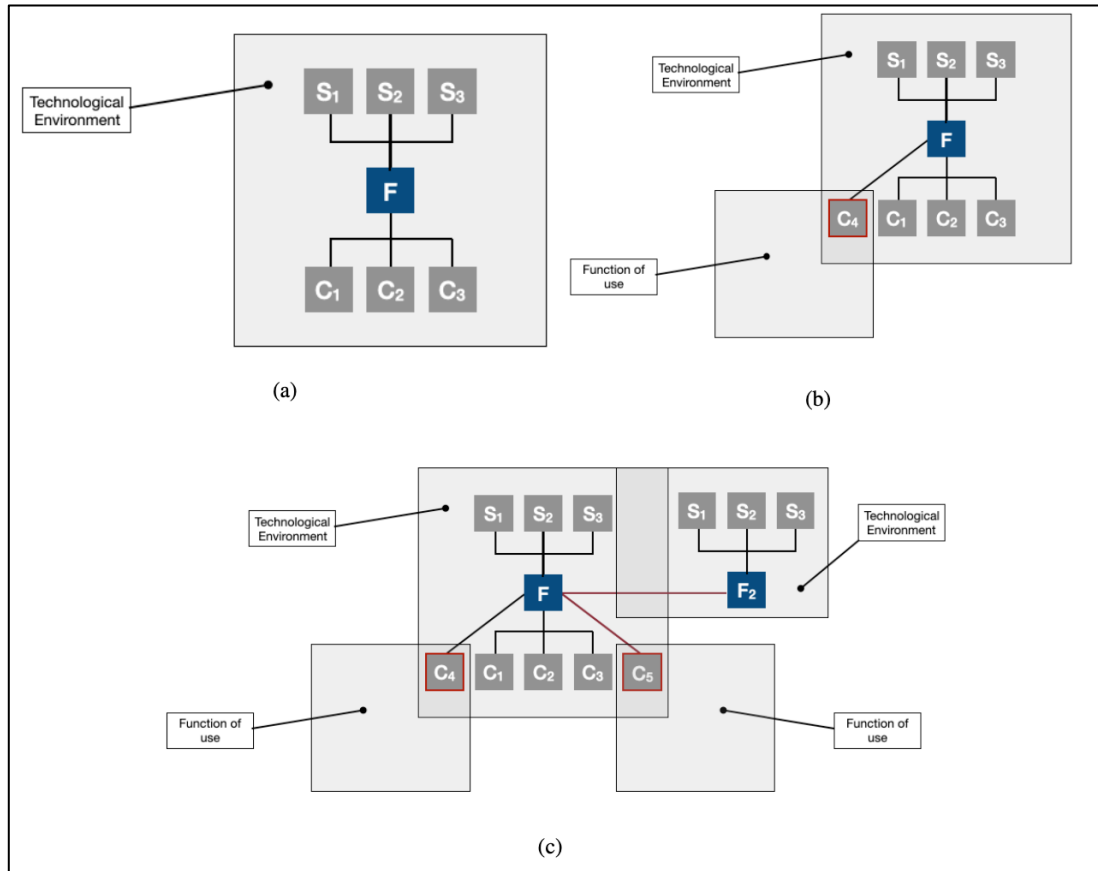


Figure 1: *Evolution phases from a Product/process-based to a Relationship-based offering system*

5. Conclusions

Our research shows how the trend of transition from a product to a solution in the business offering of a company is becoming more and more concrete and how this transition creates new dynamics in the structuring of a company's activities and network relations. Our findings have been the result of a longitudinal case studies' analysis focused on the textile industry and covering three time periods. Indeed, in the first period our study highlights that the analyzed companies focus their supply system on the product excellence, while in the second phase still along the same lines as the first, they mostly focus on product customization, without deviating too much from their usual offering system and supply chain. What appears more disruptive is the third on-going period which witnesses a transformation of the companies'

offering as a malleable “technological platform” ready for different applications. It can be integrated by a mix of different components, tangible and intangible, and technologies to support the business development of the clients and respond to a variety of use functions. This impacts on the companies’ supply chain context which is expanded to include a variety of new clients coming from different industries and a variety of new suppliers and partners with very different technological knowledge and background. The focus on companies developed in our analysis implements abilities to intercept, integrate and coordinate a variety of business relationships in the downstream and upstream supply network to enact and contribute to support the clients’ business development.

Our research presents some limitations. The most relevant limitation is that we have analyzed only four companies, and our focus has been on the textile industry at the European level. Moreover, a deeper analysis on the solution development and of the connected inter-supply network relationships are necessary. First of all, there is a need to deep into the inter-organizational relationships in the supply networks and to gather a better understanding of the nature of these relationships, if they are preserved over time, how do they are affected by the process of solution development and how they impact on the latter. Moreover, it is necessary to understand if and how the new competences acquired with the new relationships can be further used and how they can be combined within the new network context. Another further step of the research could also concern how the supply network convergence highlighted in our study may have an impact of the boundaries among industries and consequently on companies’ innovation strategies and performance. The objective would then be to concentrate the focus of our study also on different industrial contexts in order to detect any differences in the processes of opening up to inter-network relationships. It will be worth understanding whether, in the light of the insights gained from studying changes at the level of textile business networks, the same premises exist for other types of manufacturing contexts and businesses and what implications they have for their set of relationships.

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Addendum

Statement of contributions



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del Sacro Cuore

STATEMENT OF CONTRIBUTIONS

Publication title:	"Transforming the Business Offering from products to solutions. An inquiry into the textile industry"
Date of publication or status:	December 2022
Authors:	- CLEMENTE MARIA BOTTANI - MATTEO DOMINIDIATO - ANNALISA TUNISINI
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I accept the publication being included in the Doctoral Thesis of the candidate Matteo DOMINIDIATO and I accept the candidate's contribution as indicated below:

- The percentage of the Published Work that was contributed by the candidate is more than 50%;
- The candidate has participated actively in the conception, execution and interpretation of the Published Work
- The candidate has collaborated during the process of decision of research questions;
- The candidate has carried out the acquisition of data;
- The candidate has analysed the data;
- The candidate has interpreted the data;
- The candidate has participated to the draft of the manuscript;

Clemente Maria BOTTANI

Annalisa TUNISINI

PAPER II

Supplier-customer relationships for sustainability-led
innovation in the textile industry

Supplier-customer relationships for sustainability-led innovation in the textile industry⁴

Abstract

Purpose: The paper investigates sustainability-led innovation, focusing on the interplay between product and process innovation for sustainability goals and the underlying supplier-customer relationships. Thus, the paper delves into sustainability-led innovation and how it affects supplier-customer relationships, and vice versa, thus providing a twofold perspective.

Design/Methodology/Approach: The textile industry is the empirical context of the study, which is exploratory research based on in-depth, semi-structured interviews with entrepreneurs, managers, and experts in the textile industry.

Findings: In the textile industry, sustainability-led product innovation concerns mainly product durability and performance, product recyclability, and the use of waste for new product development. Process innovation deals with circular economy, traceability, and water and chemical use minimization. The paper shows also how sustainability-led innovation is implemented in more technical terms and regarding supplier-customer relationships.

Originality/Value: The paper adopts an original perspective on how processes take place in the relationships between suppliers and customers, where there is no dominance of one actor, but innovation emerges from interdependence and interaction. Such perspective allows us to provide an in-depth analysis of the supplier-customer relationships and underlying dynamics that affect sustainability-led innovation; moreover, we study how such innovation impacts supplier-customer relationships and the underlying relational dynamics. The value of the paper also stands in delivering a real representation of the innovation processes grounded in the textile industry.

Keywords: *supplier-customer relationship; innovation; sustainability; case analysis; textile industry.*

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1. Introduction

The aim of the paper is to investigate sustainability-led innovation, focusing on the interplay between product and process innovation for sustainability goals and the underlying supplier-customer relationships. More specifically, the paper delves into sustainability-led innovation and how it affects supplier-customer relationships, and vice versa, thus providing a twofold perspective.

Innovation has always been an underlying principle of the market context, and nowadays, with increasingly uncertain and volatile markets, innovation is fundamental to support the continuous process of generating value and competitive advantage (Petricevic and Teece, 2019). The innovation process has been generally and extensively studied to outline the motivations that drive innovation, the activities that implement it and how it can be managed at the company level (Lee and Qualls, 2010, Chesbrough, 2006). More recently, it has also been acknowledged that innovation is strongly linked to and positively affects sustainability (Kuzma et al., 2020). The latter is considered another major driver of business growth and change, with companies developing approaches to innovation management required to face the growing pressures and emerging opportunities linked to sustainability issues (Seebode et al., 2012). Sustainability and innovation turn out to be two aspects that nowadays go hand in hand, so innovation is often pursued to achieve sustainability-related goals (Keränen et al., 2023). Thus, the choice of linking the concept of innovation with that of sustainability in the present study seems even more appropriate at a time when there is a greater focus on and call for sustainability than ever before (Du et al., 2022).

Another relevant issue related to innovation is the role played by the supplier-customer relationships that can be a strategic source of innovation. In the last decades, extant business marketing and innovation literature has underlined how innovation is connected to interactive processes and networking (Fliaster and

Kolloch, 2017; (Chesbrough, 2006, Andersson and Mattsson, 2015, Håkansson, 1987).

There has already been a sharp increase in publications in the business marketing literature reflecting on sustainability in B2B markets (Huang and Rust, 2022), and there is an open discussion on how sustainability, understood according to the triple bottom line principle - referring to environmental, social and economic sustainability - can be embedded in various business-to-business activities to achieve efficiency and, at the same time, sustainable goals (Melander and Arvidsson, 2021). However, there is still a need to explore at a micro level and in a grounded and empirical way how sustainability-led innovation occurs and the role of supplier-customer relationships. Starting from this background, this paper develops a micro-processes analysis entering into a detailed study of the link between customer-supplier relationships and innovation. We adopt the Industrial Marketing and Purchasing (IMP) perspective to investigate the relational dynamics affecting (and affected by) sustainability-led innovation. Relational dynamics have been widely investigated by IMP scholars and can be defined as “all the changes that originate on a relationship level between counterparts, which in turn can influence the larger business network in which at least one counterpart is embedded” (Runfola et al., 2023, p.146). The paper addresses the following research questions:

RQ1: How does sustainability-led innovation affect supplier-customer relationships in terms of emerging relational dynamics?

RQ2: How do supplier-customer relationships generate sustainability-led innovation?

For this study, we consider the textile industry as the empirical context. The textile industry has been a rapidly evolving industry in the past decades and, after years of traditional production methods, has faced a profoundly changed market in which previous norms have given way to new market dynamics and innovation processes (Dissanayake and Sinha, 2015). In a rapidly changing environment, the traditional nature of the textile industry seems to be experiencing a moment of weakness in which companies must question boundaries, practices, and market

strategies. The craftsmanship of the product, typical of Italy, can no longer withstand competition from other textile industries, such as those of excellence in Germany, where the focus is on technological innovation and technical textiles, or from low-cost Eastern countries (Fromhold-Eisebith et al., 2021). Innovation appears to be an essential element for this industry, aimed at balancing craftsmanship with innovative products and processes that meet customers' needs for more sustainable and adaptable solutions (de Oliveira Neto et al., 2019). The increasing demand for sustainability in the textile industry (Guercini and Ranfagni, 2013) is due to its highly polluting nature (Roy et al., 2020), with large quantities of water and chemical components used during the production phases. Moreover, in the textile industry companies are linked together by a dense network of relationships, which represent a fertile ground where to investigate the relational dynamics put in place to develop sustainability-led innovation activities (Runfola et al., 2021).

The paper is exploratory in nature and reports on the results of in-depth, semi-structured interviews with entrepreneurs, managers, and experts in the textile industry. The paper is structured as follows: section two reports on the literature background; the third section is dedicated to introducing the method adopted in the study and the empirical context of the analysis, the textile industry; section four is devoted to the outcomes of the research; the paper ends with the conclusions reached in this study, implications, and suggestions for further research.

2. Literature background

2.1 Innovation in supplier-customer relationships

In this study, our primary focus is on the role played by supplier-customer relationships as a strategic source of innovation. When addressing the issue of innovation within the realm of business activities, various perspectives have emerged. Among these perspectives, industrial economics offers insights into different industries based on their approach to innovation. Specifically, Pavitt

(1984) distinguishes between supplier-dominated, production-intensive, and science-based industries. Supplier-dominated industries are those in which innovation within companies is primarily driven by suppliers or other actors higher up in the value chain. Von Hippel (1986) examines cases of lead users steering innovation and considers suppliers as potential sources of innovation for companies. Teece (1986) underscores how the success of an innovator hinges on complementary resources that a company can access through its inter-organizational relationships with other actors, including both suppliers and customers.

Another significant contribution arises from the open innovation approach, which marks a definitive shift away from viewing innovation as solely an internal process within a company (Chesbrough, 2006). Open innovation represents the convergence point for new innovative ideas that occur at an ecosystem level, transcending the confines of a company's internal processes (West et al., 2014). Within the realm of managerial literature, the involvement of customers and suppliers in innovation is widely acknowledged. Notable examples include research in new product development and supply chain management, which has significantly contributed to the analysis of the conditions under which suppliers and consumers can effectively and efficiently participate in a company's innovation process (Keränen et al., 2023, Vesal et al., 2022). This extensive body of literature spans several decades, with its focus on elements such as knowledge sharing, power dynamics, and collaboration (Desouza et al., 2008, Mahr et al., 2014, Petersen et al., 2005, Pihlajamaa et al., 2019, Wagner, 2012). Scholars underline how inter-firm relationships are a critical element of success for the appropriate development and implementation of innovation (Noordhoff et al., 2011, Uzzi, 1997). As Inkpen and Tsang (2005) point out, inter-organizational collaboration offers companies the opportunity to facilitate knowledge-sharing and learning processes among actors. The literature deals extensively with product-related innovation, that is, the generation of a new type of product with new features and applications (Badrinarayanan and Arnett, 2008). Such innovations, for most authors, are based

on the sharing of resources and expertise by actors involved in the same interaction context (Cantù et al., 2012, Kaartemo and Nyström, 2021). However, relatively limited attention is given to process innovation. It's important to recognize that process innovation is an essential variable in the context of product innovation (Aliasghar et al., 2019, Pihlajamaa et al., 2019, Pieroni et al., 2019). Very often, alongside product innovation, there necessarily occurs process innovation that enables the realization of the final product (Aliasghar et al., 2019, Shamsuddoha and Woodside, 2022). We define process innovation using the words of the Organization for Economic Co-operation and Development (OECD), whereby "process innovation consists of the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software".

From an inter-organizational perspective, process innovation results from the collaboration between actors who constantly interface in the activities implemented daily (Athaide et al., 2018, Brown et al., 2019, Choi et al., 2010, Cantù et al., 2012). A fundamental micro-founded approach and analysis of the dynamics of supplier-customer relationships for innovation are given by scholars in the field of business marketing. Håkansson (1987) offered a sound empirical set of studies proving how industrial technological development is founded on supplier-customer relationships. IMP literature has been developing interpretive models and conceptualizations for decades; these developments may be relevant to our purpose (Håkansson and Snehota, 2017, Snehota and Hakansson, 1995, Waluszewski et al., 2004). For instance, research has shown how companies cooperate to build innovation (Håkansson, 1987), and, more recently, studies have concentrated on the development of interactive resources in many contexts (Håkansson and Waluszewski, 2002, Lind, 2015, Prekert et al., 2022).

The literature on innovation within networks has extensively explored the innovation process, seeking to identify the driving forces behind it, the activities that facilitate its execution, and methods for controlling it at the business level (Lee and Qualls, 2010; Woodside and Biemans, 2005; Dahlquist, 2021). In the

context of innovation within business networks, this body of work reveals that relationships encompass more than just the exchange of goods and services; they serve as prerequisites for the exchange of capabilities and competencies that enhance a business's capacity to create additional value (Håkansson and Snehota, 2017). It's crucial to acknowledge that for these exchanges of resources and skills to effectively yield innovation, they must be carefully managed, especially within complex network contexts. Networks, by their very nature, comprise diverse individuals with varying positions and influences, which can make management a challenging endeavor (Aarikka-Stenroos et al., 2017). Despite the multitude of studies mentioned earlier, there remains a pressing need for a more comprehensive exploration of the knowledge associated with customer-supplier relationships, particularly within the realm of sustainability-led innovation. Furthermore, it's essential to recognize that as supplier-customer relationships drive innovation, innovation itself can significantly impact these very relationships.

2.2 Sustainability-led product and process innovation

When reflecting on sustainability, it is recognized now that it represents a strong market need that inevitably influences the decision-making process and strategic choices of companies. Sustainable strategies shape the company's approach to innovation and the innovation process by making them the means of achieving corporate goals (Melander and Arvidsson, 2022). Indeed, sustainability has become an imperative for a company's marketing strategy (Jones et al., 2008) with a positive impact on a company's performance and competitiveness, so much so that sustainability awareness have generally increased (Ferro et al., 2019). The innovative process that companies implement seems to be increasingly oriented toward a focus on ESG (Environmental, Social and Governance) principles and the triple bottom line (Ormazabal et al., 2018).

In a production setting, the economic and environmental factors might specifically converge in circularity (Keränen et al., 2023). In particular, three major activities should be understood about this latter concept: reuse, reduce and recycle (Goyal et al., 2018).

Reusing and reducing can decrease waste. However, they are sometimes more challenging than merely using recycled materials because they require more energy and resources (Ranta et al., 2020). Recycling is significantly simpler and uses fewer resources and energy because the majority of recyclable objects can be easily disassembled into their parts. Both justify the means to waste reduction by preventing valuable materials from being wasted or from ending up in landfills, where they will require a long time to decompose naturally (Sohal and De Vass, 2022). As a result, sustainability and circular economy are often discussed together in the literature (Melander and Arvidsson, 2022).

Integrating circular economy principles into manufacturing operations has emerged as a viable approach for achieving sustainability objectives (Aguiar and Jugend, 2022; Alonso-Muñoz et al., 2021). This realization underscores the importance of adopting an innovative process, especially within the manufacturing context, to shift away from traditional production paradigms. This transition involves moving from a linear approach to a circular one, where the product not only embodies sustainability but also results from an innovative, sustainable production process (Homrich et al., 2018; Alonso-Muñoz et al., 2021). However, ensuring a product's sustainability should extend beyond its end-use and final outcome. It is crucial to consider a comprehensive set of activities that encompass the entire lifecycle of the product, commencing as early as the product design phase, ideally in the most environmentally responsible scenarios (Aarikka-Stenroos et al., 2017). At this initial stage, it becomes evident that the interaction between sustainability and innovation concepts throughout the production process holds paramount importance.

2.3 Sustainability-led innovation in business marketing

Considering the preceding discussions, a company aiming to optimize its operations for efficiency and modernize manufacturing techniques in pursuit of sustainability goals must contemplate the role and potential of its resources (Nguyen et al., 2022). It is essential to evaluate the competencies and capabilities of these companies and gauge their adaptability to new market and environmental

demands (Fraj et al., 2015). To attain these objectives, these resources should be amenable to a process of amalgamation and reconfiguration to ensure their capacity for innovation. While companies may possess resources suitable for adapting to sustainability-led innovation in the short term, establishing a long-term competitive advantage rooted in sustainability-led innovation necessitates looking beyond their own confines for such capabilities (Keränen et al., 2023; Cheng et al., 2023). Indeed, as noted by Melander and Pazirandeh (2019), relationships with stakeholders beyond the typical contractual arrangements carry greater significance in the context of sustainable innovation compared to traditional innovation processes.

Thus, developing relationships with actors positioned within a company's network is likely to be a necessity. Moreover, it might be imperative to create new interaction linkages if specific skills and competencies are required that are currently absent within the relevant network. (Brown et al., 2019, Du et al., 2022, Makkonen and Johnston, 2014). In this perspective, the sustainability-led innovation process promoted by an actor must scale the supply chain by also involving other actors (Li et al., 2021, Melander and Tell, 2019). Indeed, innovation can be successfully achieved through the collaboration of actors linked by continuous exchanges. Therefore, by orienting business choices toward sustainability, even relationships must take the same direction (Athaide et al., 2018, Lo et al., 2018, Wang et al., 2020). As pointed out by Brown et al. (2019), customer-supplier relationships assume a relevant role when companies move towards innovation. This is because these interaction fosters trust and a predisposition for collaboration, leading to a privileged exchange of information that proves invaluable during the innovation process (Waluszewski et al., 2004; Snehota and Hakansson, 1995; Jaakkola and Hakanen, 2013). Additionally, it's worth noting that as the demand for sustainability gains increasing prominence in the business landscape, sustainability becomes a prerequisite for entering certain relationships and for cultivating collaborative efforts on sustainability projects geared toward creating sustainable products (Bocken and Konietzko, 2022; Fraj et al., 2013; Dahlquist, 2021). In the

context of sustainability, adhering to conventional production paradigms and a linear economy approach can lead to the erosion of relationships and, consequently, a loss of competitive advantage (Melander and Pazirandeh, 2019; Charterina et al., 2016). Investing in relationships, especially when multiple actors are involved, as is often the case in manufacturing industries (Keränen et al., 2023), proves advantageous. This holds true whether an actor wields significant influence and holds a leading market position or if the company doesn't directly champion innovation (Cantù et al., 2015).

Despite the existing body of literature on sustainability and the role of supplier-customer relationships, relational dynamics within the context of sustainability-led innovation have been relatively neglected within the realm of business marketing studies.

3. Research method

As sustainability-led innovation and the related relational dynamics are a complex and evolving issue, and the actors involved are closely linked to the dynamics of the context in which they operate, our study is exploratory and relies on in-depth interviews as the main method for data collection (Eisenhardt and Graebner, 2007). This methodological choice made it possible to understand directly from the target industry what it means to pursue sustainability-led innovation goals for textile companies and how these companies implement the dictates of sustainability in process and product innovation. Through the analysis of these two aspects, we were able to detect the relational dynamics between customers and suppliers for the achievement of sustainability goals through innovation, and those generated by sustainability-led innovation.

As the first step of our study, we selected the empirical context, namely the textile industry. The reasons behind this choice are threefold: first, the textile industry is distinguished by the complex structure of buyer-supplier relationships that shape the business network, which represents a fertile ground to investigate the various dynamics put in place to carry out sustainability-led innovation (Guercini and

Milanesi, 2019). Second, the industry has been progressively moving toward the pursuit of sustainability goals that now appear to be an acquired and imperative priority to successfully compete in global markets (Shen and Li, 2017, Shen et al., 2017; Akrouit and Guercini, 2022). Third, it is an industry that is hardly impacted by changes at the global level, and this can be relevant for companies that are constantly exposed to any change and trends at the international level (Barnes, 2013).

3.1 Selection of the respondents

After the selection of the empirical context for our study, we selected the experts to be included in the study. Experts were purposely selected (convenience sampling), with each respondent who had actively participated in sustainability-led innovation projects, thus providing an insider perspective and useful insights for this study (see Table 1 for details about the experts). The selection of respondents was conducted by targeting business representatives and industry experts in the context of traditional textiles, technical textiles, and institutional organizations. Regarding the latter, we specifically considered the industry associations that group the actors operating in the textile industry, to obtain cross-company information, since their activity is carried out at the whole industry level and not only at the company level. Regarding industry experts, they were targeted to obtain insight into the sustainability-led innovation projects implemented. The experts were selected from the technical textile industry and the traditional textile industry; within the former, we considered experts belonging to companies that develop products - historically having an industrial application – for which the focus is placed on the performance of the fabric rather than on its aesthetic content. Within the latter, we considered the production of fabrics in which the aesthetic component leads the way over the technical performance-related function. This dual focus within the industry has served to emphasize points of intersection and potential best practices in the strategies and activities of these two industries (technical textile and traditional textile), both of which are directed toward achieving process and product innovation aligned with sustainability

objectives. In addition, we have chosen respondents from companies at various levels of the textile chain (e.g., producers of yarns and fabrics) to take into account supplier-customer relationships.

Industry and number of companies	Type of companies	Role of respondent/number of respondents	Number of interviews	Duration (/min)
Institutional associations (3)	Textile association Consortium	President (1) Director (2)	3	194
Traditional Textile (9)	Manufacturer of wool yarns Manufacturer of fabrics Manufacturer of furnishing fabrics	CEO (6), Director (1), Sustainability Manager (2)	9	587
Technical Textile (7)	Certification agency Manufacturer of high-tech fibers/yarns/fabrics R&D and services Textile machinery	CEO (2), Director (1), Product director (2) Manager (2)	7	411
TOTAL			19	1192 (20 hrs.)

Table 1: *Respondents and interviews*

3.2 Data collection and analysis

We then proceeded with data collection using in-depth interviews (Legard et al., 2003). Specifically, the experts were asked questions on different levels of depth. The interview guide was composed of three parts. In the first part of the interview, the experts were asked to highlight trends that are and will be characterizing the textile industry, with a strong focus on sustainability issues. Specifically, respondents were asked to explain how sustainability has changed the behaviour and activities of textile companies, and the main dimensions of sustainability most addressed by companies. The second part of the interview concerned the propensity to innovation and innovative activities of companies operating in the industry. In particular, the experts presented and discussed in detail specific product and/or process innovation projects – in which they have taken part – that have been developed to achieve sustainability goals. Lastly, the third part of the interview raised the question of understanding the relational dynamics enacted in

the network that contributed to the effective achievement of sustainability-led innovations. The experts were asked about the main suppliers/customers involved in the abovementioned product and/or process innovation projects, how the existing relationships affected/stimulated sustainability-led innovation projects, but also how the latter generated changes in the company's relationships.

The interviews started in December 2021 and continued until June 2022. The interviews lasted from 50 to 90 minutes, for a total of almost 20 hours, and were recorded and transcribed in a Word file of about 20,000 words of transcripts for content analysis, conducted by all the research team members. The transcripts were analyzed without the use of software, using the qualitative content analysis method (Forman and Damschroder, 2007). Data analysis followed a subjective interpretation of transcripts with written synthesis and systematizations of recurrent topics. The analysis was carried out individually by each member of the research team, results were then compared through a discussion of the individual views, aimed at verifying that the interpretations were consistent with the words of the respondents, without distortion. During the discussion, we verified the degree of convergence on the main topics emerging from the interviews. This interpretative endeavour led to the creation of shared categories (recurring topics) and the related relevant quotes concerning sustainable thinking in the textile industry according to the respondents and their experience in the implementation of sustainability-led product and process innovation, and what happened at the relational level.

4. Findings

We now report the findings emerging from the interviews. First, we outline sustainability-led innovation in the textile industry, with a focus on both product and process innovation; second, we present how sustainability-led innovation is implemented discussing in more technical terms how this occurs to get more sustainable products and processes and the underlying supplier-customer

relationships. In the final section, we will discuss the implications that such findings have on supplier-customer relationships.

4.1 Sustainable thinking among respondents

In this section, the focus is on sustainability-led innovation in the textile industry from the perspective of the respondents (R1...R20 from now on) that consider sustainability as a relevant principle to be part of product and process innovation. The respondents generally agree with the assumption that sustainability in the textile context is an important variable in defining company choices and strategies. Indeed, many respondents think that, as clearly stated by R5, *“textile industry is a highly polluting sector, hence, in responding to the increased need from business customers to use more sustainable fabrics, textile companies must develop new products and new production process that includes sustainability principles in them as circular processes and new fully sustainable fabrics”*. Furthermore, sustainability has become a manifestation of the growing importance placed by consumers on the impacts of production activities. In addition to evaluating product quality when making choices, today's consumers also exhibit a keen concern for environmental considerations and the sustainability practices and behaviour of companies. These factors are fundamental pillars of a company's reputation.

Sustainability has to do with both product and process innovation, which often cannot be separated. Indeed, R12 during the interview stated that: *“you can no longer produce a sustainable product if the production processes are sustainable managed”* meaning that developing sustainable processes is a prerequisite for developing new and sustainable products. Regarding product innovation, as revealed through interviews with respondents, reimagining products for sustainability involves addressing three key facets: product durability and performance, product recyclability, and the creation of new products derived from waste materials. The respondents demonstrated a consensus on these aspects of product innovation.

In the context of durability, sustainability is achieved by developing products that simultaneously extend the fabric's lifespan while delivering performance tailored to the needs of customers. Traditionally, the market trend favored the creation of

exceptionally robust fabrics, often at the expense of yarn lightness and flexibility. However, the current challenge is to produce enduring products that also exhibit performance attributes that enhance fabric flexibility and reduce overall weight. In this sense R1 said: “Changing lifestyles, climate and work habits are making the need prevail for manufacturing brands to use lighter fibers but at the same time maintain comfort, durability and sustainability characteristics” As a matter of fact, finding lighter fabrics that nonetheless have comfort, durability, and sustainability features is becoming a greater issue for manufacturers. To match the demands of contemporary consumers, brands have been driven to modify their production processes due to shifting lifestyles, climatic conditions, and work habits. In this sense, R2 proposed an objection that found agreement from several interviewed managers: “an increasing amount of people no longer go to work during winter by foot, they rather use transports which protect them from the rigid weather. Moreover, they wear them more casually and the silks ties – as an example – are no longer used in many business contexts, meaning that products must be tailored according to new customer needs, and textiles should be lighter and performant rather than complexly woven”. Manufacturers must embrace innovative technologies such as advanced weaving techniques and synthetic materials to strike the delicate balance between lightweight design and product longevity. These technologies enable the creation of products that are both lightweight and durable, meeting the demands of consumers for comfort and environmental friendliness. By investing in these cutting-edge materials, brands can align themselves with consumer preferences and maintain their competitiveness in an ever-evolving industry.

Regarding product recyclability, product innovation for sustainability means intervening in product characteristics so that they can be the input for circular economies. As pointed out by R6: “Our goal is the development of a product whose waste can be reused in the production process, thus giving rise to circular economy processes and the treatment of waste”. From this perspective, the integration of sustainability into yarns and textiles entails a reimagining of the product,

beginning with its design, to incorporate sustainability principles aligned with the concept of circular economies. This approach necessitates that the product, apart from featuring traceable raw materials upstream, which are linked to production quality and transparency, should also be reconceptualized in terms of its weaving, blending of materials, and overall composition. By prioritizing high-quality raw materials and meticulous attention to fiber composition, the resulting fabric can be repurposed into other products with new characteristics, thereby contributing to a sustainable cycle of reuse and reducing waste.

As for the issue of waste, respondents underline that textile production is generally characterized by a lot of production waste - examples are residuals fabrics and leftover filaments in spools - which used to be only a negative item on companies' balance sheets; hence, the companies' goal is to create new target markets to which they can resell the waste that would have to be disposed of. Indeed, R15 stated that *“waste handling is a great opportunity for the textile sector in terms of revenues, new business relationships and sustainable practices. It is not an easy task, but by leveraging on new relationships with actors in other production fields, such as the automotive industry, we are now able to prepare our wastes for other uses that before this sustainability trend were impossible to think of”*.

Recycling and reuse emerge as significant considerations even within the realm of process innovation. Once again, there is a unanimous consensus among the respondents regarding key facets of sustainability-led process innovation: the importance of circular processes, stringent traceability requirements, and the minimization of the use of environmentally harmful resources and water. It is imperative to develop processes that enable companies to establish production cycles that are as circular as possible. The market needs to shift away from the traditional linear economic model towards a circular one, where the impact of production is minimized, especially concerning the reuse of production waste, either by reintegrating it into production steps or preparing it for use in other supply chains.

Furthermore, there is an escalating emphasis on traceability concerning the raw materials utilized in production, which has become a pivotal factor in acquiring product certifications. For companies in the textile supply chain, traceability translates to the ability to readily access comprehensive product information, and it has become a critical factor in the product selection process. As stated by R5, traceability requires “skills from the IT and engineering that have to be developed with specialized suppliers, and it is possible to identify the fabric through special machines that scan the fabric with inside microparticles of pigment different from the colour of the fabric, so that it is possible to understand who the product of the fabric is. It’s interesting also for the supplier-customer relationship to have not only a traceability of the product but also a higher level of transparency”.

Companies are progressively seeking detailed information about various stages of the production process, particularly those tied to the sourcing of raw materials. These raw materials must originate from certified companies that meet rigorous sustainability standards. Consequently, traceability serves as a fundamental principle, serving the interests of both companies within the textile supply chain and as a means of fostering customer trust. Concerning raw material consumption, sustainability mandates a production system that minimizes the utilization of scarce resources and the application of polluting compounds, such as chemical additives used in yarn dyeing processes.

4.2 Implementing sustainability-led innovation

The respondents delved into the practical implementation – and underlying relationships – of sustainability principles. In line with these principles, companies commit to innovation to translate them into tangible aspects of both products and production processes. Regarding the product dimension, companies undertake the development of novel types of yarns, aiming to create innovative fabrics with prolonged durability and sustained high performance. The realization of these products stems from robust collaborations with companies operating in the chemical industry. This is the case told by R2, that works in a company whose main business is the production of woolen fiber fabrics such as cashmere: “We have

undertaken a development project with a supplier from the chemistry industry, whereby the fabric is made lighter, but combined, to increase durability, with sustainable fibers, which therefore do not go to the detriment of the recyclability of the product to increase the performance that would be reduced due to the lighter fibers used". These novel blends and fibres sometimes serve as direct substitutes for traditional fabric types. In other instances, the collaboration between these two industries yields new weaving techniques that enhance fabric or filament performance. Through partnerships with the chemical industry, new methods are developed to replace synthetic polymers with natural polymers. These alternatives offer equivalent fabric performance without the use of chemical materials derived from the synthesis of fossil resources.

From the perspective of creating products that can be seamlessly reintegrated into upstream production processes, companies employ strategies to redefine their offerings from the outset. This involves developing durable products that can be recycled with minimal economic effort, allowing the fibers to be reintroduced into the production cycle in accordance with circular economy principles. In some cases, companies intentionally redesign the compositions of their fabrics or yarns to favour mono-fiber configurations. This approach ensures that the fibers can be reintegrated into the production process without impurities resulting from the combination of chemical and natural components. An example provided by the respondents pertains to synthetic textiles, which are composed of a single type of polymer, facilitating their reintegration into earlier production stages. A relevant case in this sense was provided by R11, who works in a company focused on the recycling of polyester fibers: *"my company has initiated a business line that deals with the recycling of textile fibers only, by developing a collaboration with other companies that use such fibers, to incentivize the use of only one type of fiber in their textiles, so that the recycling process can take place more easily"*. The goal is that the company can act as a customer, in that it buys waste or recovered fibers, and as a supplier of the same companies, thus creating a true circularity of the supplier-customer relationship.

In terms of waste management, companies are actively engaged in activities geared towards transforming waste into valuable raw materials for other industries, such as the automotive sector. In some instances, waste can even be reintegrated into the initial stages of the production process. This approach opens new market opportunities for companies, extending their reach to non-traditional customers who find value in these reclaimed raw materials.

Regarding innovations in the production process, particularly in highly progressive companies, there is a meticulous re-evaluation of individual processes and production steps. The primary objectives are to achieve process circularity, enhance traceability, and minimize the use of water and chemical compounds for fabric treatment. In pursuit of these goals, companies establish relationships with new partners who assist in various aspects, such as the treatment of production inventories. Some companies opt to outsource certain waste re-processing functions through these partnerships, allowing waste to be restored to its original state and subsequently reintegrated into production stages. Conversely, there are instances where companies internalize the recycling process, ensuring that waste from fabric inventories and production surplus is promptly reincorporated into the production cycle in the form of fiber.

In this regard, the company's CEO (R14) maintained that “at the moment, the technologies allow advanced fibers to be reprocessed so that they can have a new life in another production process. Today it is particularly easy for synthetic fibers such as those derived from fossil sources, the challenge for the company of tomorrow, is to be able to get back with characteristics almost like the original fiber”. In some cases, particularly virtuous companies create special production lines with which to set up processes for reusing discarded fabrics and recycling materials. One of the respondents, R9, provided the example of one company that initiated a project centered on recycling the very same chemical components employed in the process of fabricating fiber from natural source: “this has represented a large investment, thanks to the collaboration with mechanical-textile manufacturing companies, and the company has developed a completely

circular production process in which residual chemical components downstream are automatically put back into the production process, thus avoiding pollution and unnecessary waste of chemical materials”. This process innovation makes it possible to create a sustainable fiber, compared to competitors in the industry, which has enabled the company to gain a leading position in the field of sustainable fibers.

Regarding traceability, there is the scrupulous implementation of digitalization within processes, which, as stated by R14, “requires new suppliers able to manage new digital technologies and help us in the implementation. Sometimes ‘old’ suppliers are not able to deal with the digital world”.

Advanced techniques have been devised to enable product traceability at every stage of production. These methods utilize a material that, when combined with pigmentation during fabric dyeing, creates a distinct yet invisible pattern, functioning much like a QR code to identify the fabric manufacturer. Furthermore, in terms of water usage, companies are turning to process digitalization, particularly with the advent of new machinery developed from a 4.0 perspective. These machines not only synchronize seamlessly with one another across various fabric production stages through intricate efficiency-enhancing algorithms but are also capable of significantly reducing water consumption, by up to 60% compared to current practices. Additionally, thanks to these innovative calculation tools, it is now possible to precisely determine the amount of dyeing pigment required based on the yarn's absorbency capacity. This precision ensures that after the dyeing process, the water discharged from the system is potable and free from pollutants. One of the respondents (R7) works for a company engaged in the production of high-quality wools and yarns and underlines the role of cooperation with a dyeing machine supplier, which has led to the development of a technology that enables to read the absorbing capacity of the fabric and put into the water the exact amount of pigment that during the dyeing process will be completely absorbed by the fiber, leaving the water perfectly impurity-proof. As R7 claimed that “when some customers come to visit the production site, I usually

show them the workings of the machine and amaze them with the fact that from a tap I can take water and drink it since it is free of impurities and chemical elements”. Sustainable thinking and the implementation of sustainability-led innovation are shown in Table 2.

	Sustainable thinking	Implementing sustainability
Product	Product durability & performance Increase in durability and meet customer need of performances	Innovative fabrics Collaboration with Chemical Industry (new blends and new polymers)
	Product recyclability Intervention in product characteristics to make product become input for CE	Reconceptualization of the product Monofiber textiles or use of only one polymer
	New product development (waste) How wastes are handled	New Market for production waste Becoming input for other businesses (automotive)
Process	Circular economy Transition from a linear to a circular process chain (waste)	Circular process development Outsource reprocessing wastes or new production line with CE flows
	Traceability requirements Element of customer trust and monitoring product’s quality	Monitoring inputs use Inventories digitalization and new monitoring tools of raw material use
	Water and chemical use minimization	Water and chemical use minimization New IT tools to reduce water and pigments (clean water)

Table 2: *Sustainable product and process innovation in the textile industry*

5. Discussion

The findings underscore that the textile industry faces mounting pressure to spearhead sustainability-led innovation, encompassing both sustainable products and eco-friendly production processes aimed at mitigating environmental impact. Product innovation entails the creation of new or enhanced products that offer superior performance, quality, or value to customers. Concurrently, production process innovation entails the adoption of novel or improved manufacturing methods that enhance efficiency and productivity. As a result, these innovations, such as the development of new fibers derived from renewable or recyclable

materials and the reduction of water and energy consumption during production, among other initiatives, enable the textile industry to meet the growing demand for sustainable products while simultaneously curtailing its environmental footprint. The crux of these challenges lies in the interplay between suppliers and customers, underscoring the pivotal role of these relationships in driving sustainability-led innovation within the industry (Melander, 2017).

We can thus now face our research question concerning how product and process innovation for sustainability goals affect supplier-customer relationships (RQ1: how does sustainability-led innovation affect supplier-customer relationships in terms of emerging relational dynamics?).

Sustainability-led innovation leads companies to open to new relationships with both suppliers and customers specialized in different and varied technologies and belonging to different industrial settings; in other words, it is evident that there is a trend toward an enlargement of business relationships leading to a general expansion of the network to which the company belongs (Melander and Pazirandeh, 2019). In this sense, we discovered that many of the respondents leveraged existing business relationships whenever possible to facilitate sustainability-led innovation. When existing connections were not available, they actively sought out new business partners who possessed the necessary capabilities to collaborate on sustainability-led innovation initiatives. Additionally, in terms of the size of their customer base, companies have demonstrated a willingness to expand into new potential target markets (Keränen et al., 2023). For example, the development of a new business towards the marketing of production wastes. In these aspects, companies developed new business relationships with industries far away from the usual business clients' portfolio finding actors to collaborate with for the aim of handling the waste as much correctly as possible, to use it as an alternative new production process raw material. In addition, new suppliers enter companies' portfolios because they can respect traceability requirements and deliver, compliance with certification requirements. Traceability indeed is an important suitable tool. Developing product sustainably is not enough (Dahlquist,

2021). Companies are increasingly compelled to obtain sustainability certification, which necessitates a reconsideration of their business relationships. When other business actors are unable to meet the company's demand for traceability and sustainability standards, this often requires a reconfiguration of the relationship. Empirical data further demonstrate a discerning approach to the supply side of companies. Relationships with suppliers that fail to adhere to sustainability requirements are either weakened or terminated, while new partnerships are cultivated, or existing ones are reinforced as part of the company's sustainable strategy. This selective intervention reflects a commitment to upholding sustainability principles throughout the supply chain.

It is also possible to discuss how supplier-customer relationships generate sustainability-led innovation (RQ2). The empirical data show that sustainability-led innovation increasingly rarely develops within a single company but acquires relevance if developed by leveraging the main business relationships in which knowledge is shared and sustainable technologies and processes are implemented. Such supplier-customer relationships can foster innovation and create a supportive environment for sustainability initiatives. For instance, the respondents highlighted that in the development of sustainability-led innovation, particularly within the production process, their relationships with suppliers played a pivotal role in terms of collaboration and comprehension of the textile industry's specific requirements. One illustrative example involved a company seeking a novel textile colouring process. This company actively participated in all phases of the innovation journey, from conceptualization to testing, ultimately contributing to the creation of a new colouring tool that is now gaining widespread adoption in the market. This exemplifies how strong supplier collaborations can drive and shape sustainability-led innovations within the textile industry. Our findings also demonstrate that the content and dynamics of individual supplier-customer relationships change depending on the goals for achieving sustainability (Lind, 2015). If in the past the relationship was based on the exchange of information and competencies to make products that reflected the customer's needs, now the

relationships take a step forward to the content. The dyadic supplier-customer relationship becomes stronger as both parties work together to achieve sustainability goals and develop innovation. On the product side, the two parties collaborate on the definition of innovative solutions that inductively trace market demands for performance and adoption of sustainability standards; then, on the process side, supplier and customer collaborate on the development of innovative processes without which the output of the production process would be only partially sustainable.

6. Conclusion

This study revealed how the textile industry conceives product and production process innovation from a sustainability perspective and proposed an overview of the activities carried on by companies to implement the principles of sustainability in the product and production processes. We show that sustainability-led innovation takes place and is developed in the textile industry within the interaction between suppliers and customers. The IMP perspective adopted in the paper allows us to discuss how innovation for sustainability goals takes place in the relationships between suppliers and customers, where there is no dominance of one actor, but innovation emerges from interdependence and interaction (Prekert et al., 2022, Melander and Arvidsson, 2021). Thus, the paper has provided an in-depth analysis of the supplier-customer relationships and underlying dynamics that affect sustainability-led innovation and, vice versa, how such innovation impacts supplier-customer relationships. The paper also contributes to delivering a representation based on the real world of the innovation processes grounded in the textile industry.

The findings of this study could be useful also for managers and entrepreneurs of many Italian companies, not only in the textile industry but that are also following processes of sustainability-led innovation. Even if they feel the pressure of the market to be innovative and develop sustainable products, managers and entrepreneurs should keep in mind that the answer is closer than it seems and lies

in the interaction between suppliers and customers. Suppliers, such as the producers of yarns in the textile industry, still play a fundamental role in process innovation, but at the same time, the companies that are more in contact with the final consumer are more aware of what the market requires in terms of new sustainable products. The interaction between the two appears to be the trump card towards sustainability-led innovation. Thus, on the one hand, entrepreneurs and managers should consider the advantages that can be gained, in terms of innovation for sustainability goals, by the existing and consolidated interactions, especially when suppliers and customers work together in the same sustainable direction. On the other hand, entrepreneurs and managers should be open to considering new relational opportunities, since sustainability-led innovation might require new technologies or skills that could be even outside the industry, or don't be afraid to close the relationships with consolidated suppliers that are not able to achieve the sustainability standards and goals.

The paper has some limitations that we acknowledge and could be overcome with future research. The paper focuses on the textile industry only, but we are aware that sustainability-led innovation is a compelling issue for many industries, such as the automotive, food, and paper industry, to cite a few. A comparative study could shed light on the different roles of supplier-customer relationships and the underlying relational dynamics. Moreover, the paper employs in-depth interviews with experts in the field. While this provides an overview of sustainability thinking and actions in terms of process and product innovation, each kind of product and process innovation (e.g., product durability/circular economy) can be unpacked as a relevant case. Thus, single, longitudinal case studies of companies implementing specific kinds of sustainability-led innovation could provide much more insight both into the technical aspects and the relational dynamics.

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Addendum

Statement of contributions



STATEMENT OF CONTRIBUTIONS

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I accept the publication being included in the Doctoral Thesis of the candidate Matteo DOMINIDIATO and I accept the candidate's contribution as indicated below:

- The percentage of the Published Work that was contributed by the candidate is more than 50%;
- The candidate has participated actively in the conception, execution and interpretation of the Published Work
- The candidate has collaborated during the process of decision of research questions;
- The candidate has carried out the acquisition of data;
- The candidate has analysed the data;
- The candidate has interpreted the data;
- The candidate has participated to the draft of the manuscript;

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PAPER III

Beyond Size: tracing the development of a Startup and Medium Sized Company Relationship and the influence on the business network.

Beyond Size: tracing the development of a Startup and Medium Sized Company Relationship and the influence on the business network⁵

Abstract

Purpose. This research attempts to examine the development of a relationship between a startup and a medium-sized company, as concentrating on how it progresses from a basic buyer-seller interaction to a strategic partnership. The key goal is to understand the details of this relationship and its effect on the companies' business network.

Design/methodology/approach. This study employed a longitudinal case study methodology, integrating in-depth interviews with key stakeholders from both a startup and a medium-sized company. A thorough knowledge of the relationship growth is achieved by examining the contacts, exchanges, and collaboration that have occurred throughout time.

Findings. The results of this study show that partnering a startup and a medium-sized business is possible when there is a match in terms of strategic direction. The relationship develops and deepens despite the inherent size differences as both sides see the possibility of mutual advantages and make use of their unique capabilities. In order to build a successful cooperation between firms of different sizes, the research underlines the need of a common vision, complementary business strategies.

Practical and Social implications. Despite their inherent disparities in size, this research reveals the practical implications of the interaction between a startup and a medium-sized business. Both sides need to understand the characteristics of these interactions in order to take use of their individual strengths and overcome any possible obstacles. Additionally, this research looks at the social consequences, emphasizing how cooperation and partnership between organizations of different sizes may promote innovation.

Originality of the study. This study is distinctive since it examines the dynamics of resource interaction between two businesses of different sizes. This study adds to the body of knowledge by shedding light on the elements that help a relationship change from a buyer-seller relationship to one that is more like a partnership. It also looks at how this relationship progression affects the connected network of businesses where both companies are active, providing fresh viewpoints on network dynamics in the context of different firm sizes.

Keywords: *Start-ups, medium-sized company, relationship development, partnership, size disparity, business network*

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1. Introduction

The business network landscape undergoes constant changes, propelled by the dynamics of business relationships. Discussing relationships between businesses, especially those of varying sizes, provides an intriguing avenue for development, innovation, and market expansion. This study contributes to a broader research theme, examining the integration of supply-chain concerns with entrepreneurial challenges, particularly in business interactions (Baraldi *et al.*, 2020). Startups and medium-sized businesses, with their unique traits and complementary qualities, form a promising relationship (La Rocca *et al.*, 2013).

This research aims to explore the evolution of such interactions, focusing on the progression from a simple buyer-seller relationship to a partnership, irrespective of size differences. Additionally, it examines the impact of this relationship development on the larger business network in which the two companies engage, with a specific focus on the evolving process between a startup and a medium-sized enterprise. This relationship, despite the inherent dimensional differences between the two business realities, provides insights into fostering a collaboration that goes beyond a simple dyadic buyer-seller relationship.

Startups, defined by their entrepreneurial attitude and dynamic capabilities based on digital processes, collaborate with medium-sized businesses possessing established resources, knowledge, and a robust market presence (Aaboen and Aarikka-Stenroos, 2017, Halberstadt *et al.*, 2021, Ribeiro-Soriano and Piñeiro-Chousa, 2021). However, the small size of startups often means they lack a strong distinctive capability in their market context, especially in rigid and concentrated competitive industries like textiles. Accessing key relationships crucial to their success may be challenging due to their nature as startups.

While many studies have explored how startups can interact with larger players, addressing issues such as trust and relationship development, less attention has been given to how startups can evolve to benefit both themselves and their partners. Bridging the gap between startups and medium-sized businesses presents

challenges, including size differences, divergent corporate cultures, and competing strategic objectives (La Rocca *et al.*, 2019).

Understanding how two organizations with different business models, sizes, and competitive positions can pursue parallel growth paths is complex. Therefore, this study employs a longitudinal study method (Pettigrew, 1990) and in-depth interviews to comprehensively explore the evolution of a relationship between a startup and a medium-sized business. By tracking this relationship over time, the study aims to uncover the nuanced nature of the interaction, identify crucial elements influencing its growth, and investigate how resource interaction mechanisms function between businesses of varying sizes.

Moreover, the research delves into the effects of this relationship's growth on the broader business network. As the bond between the startup and the midsize business deepens, the dynamics and exchanges within their operating network are likely to undergo transformations. Understanding these network-level implications provides valuable insights into organizational relationships and the potential downstream effects of creating strategic partnerships.

2. Literature review

This paper contributes to the ongoing discourse between network-related and entrepreneurship-related studies, focusing particularly on the development and progression of startup businesses. Existing studies recognize the evolutionary process of new businesses as a social rather than individualistic phenomenon, involving intricate business network relationships (Gerli *et al.*, 2012, La Rocca and Snehota, 2014, Pettigrew, 1990).

Across various literature domains such as supply-chain management, strategic management, and industrial marketing, there is a unanimous agreement that businesses can enhance their operations through collaboration with other actors. This collaboration, especially with external actors, is deemed essential for acquiring the resources necessary for startup development (Baraldi *et al.*, 2020).

The objective of this paper underscores the importance of studying how the relationship between structured businesses and startups serves as a critical success factor for the startup itself. This significance arises from the continuous exchange of resources inherent in small business activities. Resource exchange emerges as a pivotal consideration in understanding the relationship between a structured business and a new venture. It manifests in various ways throughout the lifespan of the relationship, evolving from a simple exchange of resources to a more profound connection where both tangible and intangible resources, including skills and capabilities previously absent in either party, are exchanged (Dyer and Singh, 1998, Handfield, 2019, Li *et al.*, 2021).

The literature highlights diverse categories of resources potentially involved in these interactions, encompassing financial, human, technological, and intellectual resources. Over time, the content and manner of interaction change due to factors like trust, investments, and mutual adaptation, influencing cooperation between enterprises. In a buyer-seller relationship, there is a continuous and progressive exchange of resources, leading to the gradual consolidation of trust. This trust manifests in concrete forms such as the exchange of industry information, joint innovation processes, and the reliability of supply and payments (Bocconcelli *et al.*, 2020, Prenkert *et al.*, 2022).

Businesses in networks can achieve competitive advantage and mutual benefits through the sharing of resources and expertise (Håkansson *et al.*, 2009, Håkansson and Snehota, 1989). Despite differences in size, the two firms can collaborate and become partners, progressively strengthening their relationship. However, the literature on resource interaction underscores the pivotal role of networks in enhancing resource interaction and creating opportunities for innovation and growth (Cantù *et al.*, 2012, Lambe *et al.*, 2002).

Moreover, when considering the dynamics of resource interaction, the literature often employs the relationship as the dyadic unit in which this exchange inherently transpires. As emphasized by Håkansson and Snehota (2017), firms do not operate in isolation. Particularly, newly established firms must look to relationships as a

source of competitive advantage contributing to their development. Baraldi et al. (2020) assert that firms must engage with other relevant entities to foster business development, acknowledging the necessity of interactions that contribute to success alongside distinctive entrepreneurial traits (Aaboen and Aarikka-Stenroos, 2017, Aaboen *et al.*, 2013).

Companies, especially those new to the market, need to establish business relationships with suppliers and customers. This task becomes complex for startups, starting from scratch and having to initiate new relationships amidst imbalances of power, capabilities, and resources to manage these relationships.

The Industrial Marketing and Purchasing (IMP) literature has long recognized the significance of leveraging business networks for the economically sustainable development of new entrepreneurial ventures. The entrepreneurial process is considered a phenomenon embedded in social relationships specific to a network (Aaboen *et al.*, 2013, La Rocca *et al.*, 2019, Parry, 2020, Uzzi, 1997).

However, establishing relationships for a newly opened venture is not a straightforward process. The IMP literature highlights the delicate nature of relationship access for new ventures. Entering a network and managing relationships over time pose challenges for small businesses due to size differences and the difficulty of managing relationships that are not well-established and, therefore, very fragile (Bocconcelli *et al.*, 2020).

To be part of a network, firms not only need to invest heavily in relationship strength but also in developing an identity for their business model and value proposition, making it attractive to more established players in the network (Håkansson and Waluszewski, 2007).

Besides relationship access, the strength of relationships is a crucial element supporting venture development. Baraldi et al. (2020) demonstrate how scientific "discoveries" can lead to entrepreneurial opportunities through combining socio-technical elements into a coherent network of actors. Enterprises, by enforcing one or more relationships, can solidify their ideas by garnering network commitment for realization (Rondi *et al.*, 2020). However, Perna *et al.* (2015) note

that when the relationship between more structured firms and startups becomes so strong that larger firms become part of the innovation process, the former tend to modify them to fit their programs, potentially causing a fundamental change in the startup's development path.

The IMP literature reflects on how individual actors' autonomy is limited and constantly mediated by a process of interaction among network businesses, manifested in resource combination and acquiring a position in the network. Joining a pre-existing network requires the new firm to be accepted as a partner in various relationships and acquire an identity among other firms in the relevant business network (La Rocca and Perna, 2014).

Several studies analyzing technology-driven startups originating in science reveal that the enterprise development process is a social phenomenon based on interactions with actors in the business environment of the new enterprise (Pencarelli, 2022). The evolution of the business idea is observed as a non-linear phenomenon representative of continuous interactions among actors influencing its advances and characteristics.

Reflecting on the role of a dyadic relationship between buyer and supplier, due to strong and non-sporadic interactions, becomes essential in understanding the entrepreneurial process's development. While literature has explored the interaction between network actors, both suppliers and customers, fewer studies have examined the buyer-seller relationship from a dimensional difference perspective. Additionally, the effects of a new relationship with a startup and its impact on the network of ties with other actors require more careful consideration (Tunisini and Bocconcelli, 2013). A relationship between a small and a large firm, for instance, may offer opportunities for suppliers and other network actors but could also pose risks and obstacles for firms not directly participating in the collaboration (Ribeiro-Soriano and Piñeiro-Chousa, 2021).

In light of these considerations, this study aims to reflect on two research questions:

RQ1: How does the dynamic between a medium-sized company and a startup evolve within the context of a buyer-seller relationship?

RQ2: How does the development of the relationship impact on the two companies' business network?

3. Methodology

3.1 Research Methodology

This study adopts an exploratory research approach, utilizing a longitudinal case study involving two companies: a well-structured medium-to-large business and a startup. The literature section highlights that the development of entrepreneurial ideas involves continuous interactions among multiple actors rather than a linear and immediate process (Easton, 2010, Stake, 1995). Therefore, the longitudinal approach is deemed valuable to understand the evolving interaction between these two enterprises and how this relationship develops over time, influencing the network in which they operate (Aarikka-Stenroos *et al.*, 2017).

A longitudinal study involves observing the development of a phenomenon at several points in time, providing detailed insights into the dynamics and processes of progress. This methodology proves useful for understanding the behavioral aspects of firms over time and the dynamics involving relevant actors and networks (Aarikka-Stenroos *et al.*, 2017, Pettigrew, 1990).

The case study approach is particularly advantageous for studying the interaction of resources within business connections embedded in networks, where different actors control diverse resources, each with their objectives and incentives (Eisenhardt, 1989, Halinen and Tömroos, 2005). This method has been employed in various studies involving this type of relationship (Baxter and Jack, 2008, Yin, 1994).

In industrial marketing and purchasing literature, the single-case study methodology has been widely used to explore the importance of business

relationships in entrepreneurship. For instance, La Rocca, Perna, Snehota, and Ciabuschi (2019) examined the role of supplier connections in creating new entrepreneurial ventures. Coviello and Joseph (2012) investigated the impact of business networks on the internationalization of a small software company and Axelsson and Easton (2016) used a single-case study to analyze collaboration practices between a small and a large firm in the context of interorganizational connections in business networks.

These studies demonstrate the advantages of the single-case study methodology in investigating the function of business links in entrepreneurship. It allows for an in-depth analysis of the mechanisms underlying successful collaborations and identifies the influence of relationships on larger business networks.

3.2 Empirical Case Selection

This research focuses on the relational dynamics within a buyer-seller relationship, examining the case of two companies: a medium-sized supplier and a startup customer. Since the startup's foundation, these companies have collaborated, benefiting the startup's development due to the well-established nature of the larger company. Over time, the relationship between these two companies has deepened, evolving into a partnership. This provides insight into how the relationship is maintained and invigorated by specific factors. Importantly, the relationship is optimal for the case study because, in a final stage, the larger company decides to acquire the smaller one, showcasing how the relationship can evolve into a strong bond, consolidating into an acquisition.

For the second part of the study, this case is emblematic for examining network dynamics. The startup, operating as a B2C business, interacts with a multitude of actors both upstream and downstream, distinct from the larger company. The evolution of the relationship has led to changes in the network dynamics within which the two companies operate.

3.3 Data collection and analysis

When delving into business cases, it becomes imperative to consider evolving data sources (Yin, 1994). The primary data source for this study comprised 8 in-depth interviews with representatives of the two companies involved in the relationship, spanning a period of 3 years.

Initially, the interview questions centered on comprehending the business model of both companies, offering detailed insights into their respective business environments. Subsequently, the focus shifted to different stages of the relationship, aiming to extract the developmental dynamics by examining the activities and resources employed within the collaboration. The interviews also sought to discern changes in roles and responsibilities over time. Commencing with inquiries about the companies' needs and how these influenced the decision to engage in the partnership, the interviews aimed to grasp the incentives and goals driving the collaboration. The interviews then transitioned to the genesis of the cooperation, exploring how the partnership originated and evolved since its inception. This provided valuable insights into the foundational elements of the collaboration, challenges encountered, and the strategies employed by the organizations to overcome them. Interviewees were also prompted to articulate how the partnership influenced their company's operations, pinpointing the resources needed for specific activities and identifying necessary changes to these resources.

Ultimately, the interviews turned their attention to the potential inclusion of new actors in the partnership. Following Pettigrew's (1990) perspective, it is crucial for researchers to acknowledge each actor's limited access to knowledge, influencing their interpretation of specific processes. Hence, establishing follow-up contacts was deemed important to continually understand evolving perspectives and maintain a nuanced understanding of the ongoing dynamics.

Date	Company	Respondent's Role	Duration
Oct. 2020	REDA	CEO	70 min
Nov. 2020	LANIERI	CEO	65 min
Jun. 2021	REDA	CEO	30 min
Sep. 2021	REDA	CEO	48 min
Mar. 2022	REDA	CEO	39 min
Mar. 2022	LANIERI	Director	72 min
Apr. 2023	REDA	CEO	52 min
May. 2023	LANIERI	CEO	83 min
Total Amount			459 min (7h 35min)

Table 1: Set of interviews with both Companies

The interviews conducted varied in duration, ranging from approximately thirty to eighty minutes, with an average time of 55 minutes, as indicated in the table. Questions posed during these interviews encompassed discussions on the business model, motivations for the partnership, and resources utilized throughout the collaboration, aligning with the goals of the paper. Key points and themes agreed upon by the respondents during the discussions were compiled into a briefing document created after each meeting. Clean copies, following Eisenhardt (1989) recommendation, facilitated the review of previous conversations in light of more recent ones.

In addition to interviews, documents such as internal corporate reports were employed to gather information. The ARA model, focusing on resources, served as a primary tool for structuring and comprehending data (Håkansson, Ford, Gadde, Snehota, & Waluszewski, 2009). This framework directed the search for empirical data, guiding the exploration of additional concepts that allowed theoretical lenses to capture the fundamental features of the phenomena under study. The simultaneous overlap of data analysis and collection facilitated the evaluation of data and refinement of the tool for structuring and interpreting the data, showcasing the flexibility of data collection. This approach, referred to as "systematic combining" (Dubois and Gadde, 2014), was employed throughout the case study.

Following data collection, the research adopted a subjective interpretation approach to analyze transcripts, involving the written synthesis and systematic categorization of recurring themes. Each discussion report was meticulously compared to ensure consistency with respondents' statements without distortion. The study amalgamated information from respondents' reports to examine the evolving relationship between the startup and the medium-sized business. The primary goal was to identify variables impacting the development of their partnership, emphasizing the fundamental causes of this development, challenges encountered during integration, and the resulting advantages experienced by both parties.

Additionally, the analysis delved into investigating new dynamics at the network level, focusing on any new actors included in the existing network and exploring changes or strengthening of dynamics among current members. By exploring these facets, the study aimed to provide a comprehensive understanding of how the network changed over time and the dynamics impacting the relationship between the startup and the medium-sized business.

4. Case Study

4.1 Companies' presentation

To address the research questions, this study centers on a single case study examining the interaction between two textile companies: Reda and Lanieri. Reda, a medium-sized company, specializes in high-quality fabrics and textiles for the fashion and clothing industries. Conversely, Lanieri focuses on custom-made men's clothes, renowned for their quality and excellent customer service, operating as an online store with physical showrooms in major European cities. Both companies navigate challenges in a highly competitive market marked by intricate business relationships and a focus on innovation, driven by their distinct business models.

Reda, an established player in high-end textile manufacturing, specializes in creating top-tier fabrics for the fashion and garment industries. Its product range

includes fabrics made from wool, silk, cashmere, and natural fiber blends, catering to domestic and international customers. Operating in a competitive market, Reda prioritizes innovation and sustainability, with a history of excellence fostering strong relationships with clients and suppliers globally. With over 500 employees and annual sales ranging between 100 and 150 million euros, Reda's headquarters are located in the Biella textile district in Italy. The company's commitment to quality and innovation is reflected in its research and development efforts, aimed at creating new products and processes. Customer relationships are a focal point, with close collaboration to tailor solutions to individual requirements, ensuring lasting partnerships. Reda's emphasis on sustainability is evident in its participation in environmental programs, including the use of renewable energy sources, recycling, and waste reduction.

Lanieri, founded in 2012, specializes in custom-made men's suits, quickly gaining a reputation for high-quality products and exceptional customer service. The company's suits are personalized to each customer's unique dimensions and preferences, using the finest fabrics from renowned textile manufacturers. Emphasizing sustainability and ethical business practices, Lanieri employs eco-friendly textiles, recycling programs, and waste reduction methods. The company operates as an online retailer, offering customization options through its website and physical showrooms across Europe. Lanieri's innovative business strategy and focus on quality and customization contribute to its success in the competitive men's apparel sector. With a lean organizational structure, Lanieri employs around 50 employees, primarily in Italy, across various roles in design, production, and marketing.

This comprehensive case study explores the distinctive characteristics, challenges, and strategies of both Reda and Lanieri, shedding light on the dynamics of their interaction in the competitive textile industry.

4.2. Case study presentation

Lanieri originated from the vision of two engineers who conceptualized an online platform for crafting bespoke suits using a sophisticated algorithm capable of

processing measurements obtained from the comfort of one's home. This initiative took shape within a university incubator at the Polytechnic University of Turin, with funding from Reda and collaboration with another significant textile manufacturer based in Biella. The collaborative journey began with a strong buyer-seller relationship, as Reda and the partnering company supplied fabrics for clothing production.

The relationship deepened as Lanieri gained credibility and access to the competitive textile and clothing context through the support of Reda and the other company. In 2018, the collaboration reached a milestone when Reda decided to acquire Lanieri, envisioning a mutually beneficial path. Bringing Lanieri into Reda's Vallemosso premises aimed not only to enhance internal development but also to integrate digital strategies, a key focus for Reda. However, the onboarding process faced challenges due to the rigid corporate approach, typical of a century-old family business. Despite efforts to adapt, the process proved complex for both the startup and Reda, leading Lanieri to relocate from Reda's premises to co-working spaces in Biella and later to dedicated offices in Milan.

The collaborative journey facilitated the exchange of resources, including financial support, knowledge, and sector-specific skills initially lacking in the startup. In 2020, witnessing the growth of Lanieri's business volume, Reda decided to initiate a spinoff, creating the company Tailoor. Tailoor focused on refining Lanieri's customization algorithm, involving teams of engineers and experts from the digital and made-to-measure sectors. Additionally, Tailoor aimed to offer its customization software as a service to third-party companies in the luxury sector, extending beyond clothing. The CEO of Tailoor emphasized the platform's versatility, comparing its impact on customization in other businesses to variables like the wheel of a vehicle, the lace of a shoe, or the color of a skateboard. This strategic move showcased the adaptability and innovative spirit born from the collaborative evolution of Lanieri within the broader business network.

5. Findings and discussion

5.1 Relationship development

This study delves into the continuous development and fine-tuning of the relationship between Reda and Lanieri, which initially started as a supplier relationship and eventually progressed to a partnership. The collaboration between Reda and Lanieri stands as an illustrative example of a buyer-seller relationship that has proven mutually advantageous for both companies. The developmental trajectory is outlined below, as depicted in the accompanying image, delineating three stages that signify key milestones in the evolution of their partnership relationship.

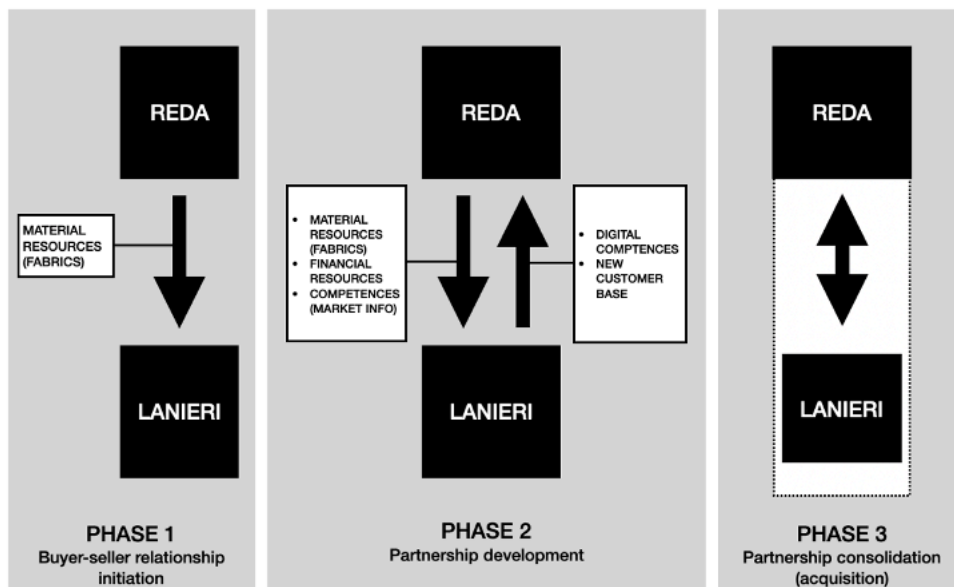


Figure 1: *Three phase development of the relationship*

5.1.1 Buyer-supplier relationship initiation

In the initial phase, as highlighted in the case history presentation, Reda functioned as a supplier for Lanieri, providing fabrics for the production of its tailor-made garments. This phase of the relationship, typical in the early stages and characterized by a size difference, revolves around a straightforward customer-supplier dynamic involving the exchange of material resources.

During this period, the startup, according to Reda's CEO, faced limitations in core competencies necessary for venturing into the textile-clothing market. The founders, while having a clear goal of creating custom-made clothing, lacked essential expertise, particularly in the complex textile market. The professional background of the founders as engineers, though valuable, was insufficient for the intricacies of the clothing industry.

This assessment aligns with the perspective of Reda's CEO, who emphasizes that Lanieri lacked the necessary dimensional characteristics to effectively collaborate with other fabric producers and garment manufacturers. Despite the challenges stemming from these limitations, the relationship in its early stages began to strengthen due to the heightened exchange of expertise between the two companies. This period marked the initial steps toward a more collaborative and mutually beneficial interaction.

As a supplier, Reda played a pivotal role in providing the foundational materials for Lanieri's garments, while Lanieri, despite its initial limitations, started to benefit from the expertise shared by Reda. This exchange of knowledge and resources laid the groundwork for the evolution of their relationship beyond a simple customer-supplier dynamic.

5.1.2 Buyer-supplier partnership development

The exchange of expertise between Reda and Lanieri evolved beyond the knowledge sharing, encompassing an exchange of financial resources that aimed at supporting Lanieri's innovative ventures, including specific projects such as a unique collection exclusively designed for Reda. This progression in their relationship moved beyond a conventional customer-supplier dynamic, fostering an environment characterized by mutual trust and cooperation, eventually verging on a more partnership-oriented model.

The intensification of this relationship, irrespective of their size differences, was made possible by incorporating strategic interests of both organizations beyond the traditional customer-supplier framework. Reda, on one hand, sought to acquire digital skills integral to Lanieri's business model, recognizing the

significance of digitalization in today's market landscape. Simultaneously, Reda contributed industry-specific skills and well-structured organizational expertise to Lanieri.

As depicted in Figure 1, Reda strategically leveraged its extensive resources as a well-established player in the textile industry, aiming to gain access to digital expertise, expand its customer base, and enhance brand recognition. The accumulated expertise over many years empowered Reda with substantial financial resources, organizational capabilities, and comprehensive knowledge and skills in the textile industry. These resources enabled Reda to invest in innovative technologies, research and development, and sustainable business practices, further enhancing its competitiveness.

Reda's organizational capabilities, including experienced staff and efficient supply chain management, played a crucial role in ensuring smooth operations and delivering high-quality products and services to consumers. In contrast, Lanieri, being a digital company, brought distinctive resources to the relationship, particularly superior digital skills. These skills facilitated the establishment of a robust online presence, innovative marketing methods, and outreach to new customers.

Lanieri's specialization in made-to-measure clothing not only attracted customers but also contributed to Reda's reach by bringing in new clientele. Lanieri's digital expertise played a positive role in modernizing Reda's operations and increasing competitiveness. The Internet platform developed by Lanieri served as a valuable asset, providing access to customers in Europe. The platform, coupled with technology and digital infrastructure investments, streamlined operations, and enabled efficient, personalized services.

Moreover, Lanieri's digital focus allowed for the collection of crucial customer data on preferences and behavior, facilitating continuous improvement in products and services. This digital emphasis proved to be a significant asset for Lanieri, allowing it to quickly establish itself in the highly competitive men's fashion industry and cultivate a loyal customer base. The collaborative exchange of

resources and expertise thus created a symbiotic relationship, benefiting both companies in navigating the challenges and opportunities of the evolving business landscape.

5.1.3 *Partnership consolidation*

The relationship between Reda and Lanieri experienced a gradual and reciprocal intensification, marked by an exchange of resources that positioned both companies on a more equal footing over time, transcending their size differences. Reda's CEO, in multiple interviews, emphasized how Lanieri, with its distinctive digital business model and uncommon value proposition in Italy, had evolved into an established partner.

This deepening relationship, coupled with Reda's strategic investment in Lanieri, played a pivotal role in sparking Reda's contemplation of acquiring Lanieri in 2018. According to Lanieri's CEO, the relationship had evolved beyond a mere exchange of resources and expertise. Through the acquisition, Lanieri seamlessly integrated into the Reda Group, aligning itself with an entrepreneurial legacy spanning over a century and contributing to the realization of Reda's strategic goals, uniting textile tradition with digitization.

The acquisition not only served to formalize the existing state-of-the-art collaboration since 2016 but also propelled Lanieri's development. Reda acted not only as a financial supporter but also as a guarantor in the market for Lanieri's endeavors. Simultaneously, Lanieri played a crucial role in advancing Reda's ambition to digitize the company and access a broader customer base through an alternative channel, creating awareness about the brand and the quality of Reda's fabrics. This collaborative synergy solidified their partnership, transcending a transactional relationship and inaugurating a shared journey towards achieving common goals and digital transformation.

5.2 Network implications

This section delves into the repercussions of the evolution and alterations in the relationship between Reda and Lanieri on the network of companies to which

these firms are connected. The amalgamation of these two companies has exerted significant and extensive effects on the network within which they function. The collaboration between Reda and Lanieri represents a form of inter-organizational engagement that has given rise to novel perspectives for value generation and innovation, particularly for two organizations operating within distinct industries and with different organizational dimensions.

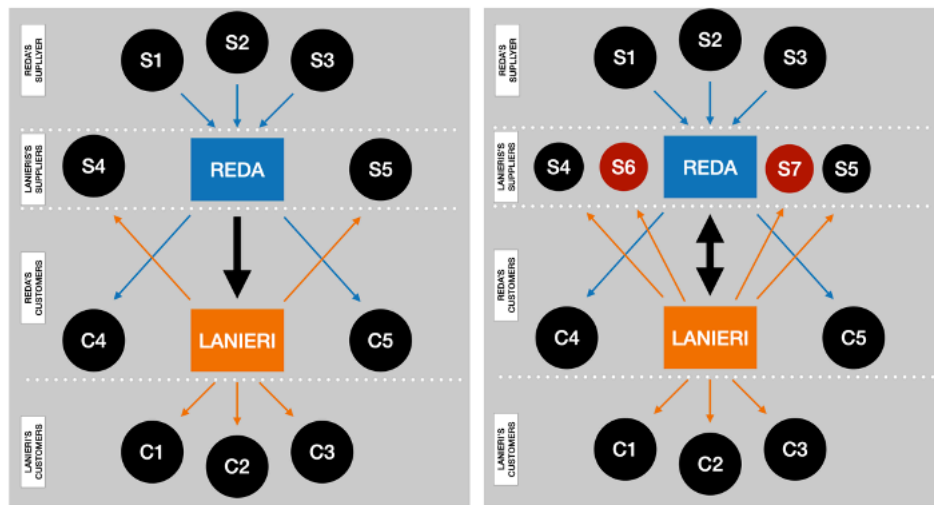


Figure 2: *Network effects of the relationship development*

In the initial phase illustrated on the left in Figure 2, it is evident that during the first two stages of relationship consolidation, as discussed in the preceding section, there were no discernible dynamics within the network of the two firms. Reda and Lanieri maintained their separate business networks, and what transpired was the consolidation of their specific relationship. The true impact on the network materialized in the subsequent phase (phase 3, as indicated in the preceding paragraph) when the development of Lanieri prompted Reda to bring not only financial resources but also industry expertise and credibility inherent in a company of Reda's magnitude, which Lanieri lacked. The strategic acquisition of Lanieri by Reda was not only geared toward Reda's digitization goals but also instrumental for Lanieri, as it became associated with the Reda group, gaining access to a range of relationships previously beyond its reach. The credibility input

from Reda's acquisition was crucial for Lanieri, as establishing trust is paramount in the textile industry, particularly for apparel manufacturers.

As depicted in Figure 2 on the right side, Lanieri, on the supply side, engaged with two new actors (depicted in the red circles: S6 and S7) following the acquisition, a result of the enhanced level of trust. The evolution of the relationship through acquisition significantly influenced the expansion of both companies' business networks. Lanieri gained entry into Reda's network of textile industry suppliers, unlocking new avenues for growth. Concurrently, Reda leveraged Lanieri's digital expertise and online platform, gaining access to a new customer base (depicted as "Lanieri's customers" in Figure 2). Through this acquisition, Reda expanded its market share, particularly in the B2C sector, where it had limited exposure previously.

This collaboration not only allowed Reda to diversify its product offerings and reach new customers but also contributed to breaking down the traditional buyer-seller relationship, fostering a more collaborative approach to value creation. The partnership facilitated the expansion of both organizations' networks, fostering more collaborative relationships and creating new opportunities for innovation and learning by leveraging each other's resources and competencies.

Furthermore, since 2021, Reda, emphasizing its investment in the backend running the Lanieri platform, initiated a spinoff called Tailoor. This venture aims to extend the personalization software to other companies, showcasing the software's versatility to cater to a broader customer base outside Reda's existing network. In line with a servitization-oriented business model, Reda intends to offer the platform as a service to third-party companies, enhancing its presence and influence beyond its traditional boundaries.

6. Conclusions

This study delves into the evolution of a relationship between a startup and a mid-sized business, transitioning from a basic buyer-seller configuration to a partnership, and assesses its impact on the overall business network. The findings

underscore the dynamics and effects of such collaborations, highlighting the importance of aligning business objectives and leveraging reciprocal resources and networks. The development of the relationship between Reda and Lanieri exemplifies the growth and mutual advantages achievable through collaboration between startups and midsize businesses.

Reda, with a strategic focus on digitalization and a quest for a new consumer base, recognized the value in working with Lanieri. Simultaneously, Reda provided structured management, access to business ties, and market position to Lanieri. This confluence of company goals facilitated the formation of a robust and evolving collaboration. Lanieri, lacking distinctive capabilities in comparison to Reda, benefited significantly from Reda's established business in the industrial context, allowing Lanieri to establish itself in the market. This collaboration accelerated the trust-building process with other companies, crucial for Lanieri's business continuity.

Reda acted as a catalyst, guaranteeing reliability toward other actors in the network by serving as both a supplier and a funder for the startup. This collaboration also had notable consequences for the business network. Both companies gained access to each other's networks, opening up new opportunities. Lanieri's access to Reda's network was pivotal for its business success, emphasizing the value of strategic alliances in accessing new markets, consumers, and resources.

The influence on the network was twofold. Lanieri, supported by Reda's standing, consolidated relationships, diversified its offerings, and improved reliability. In contrast, Reda extended its network downstream, gaining closer contact with the final demand of the market.

From a managerial perspective, the study underscores the value of mid-sized firms focusing on the potential for startups to access existing business relationships, which may have been previously inaccessible. For startups, leveraging their dynamic and innovative capabilities, often not possessed by larger firms, is crucial for developing strong and mutually beneficial partnerships.

While the study provides valuable insights, its limitations, such as the relatively short three-year time frame, should be acknowledged. Future research could extend the study for a more comprehensive understanding of the relationship's long-term impacts and incorporate perspectives from other members of the business network. Exploring the implications of partnership development on the business models of the involved companies and the story of Reda's spinoff could offer additional valuable insights. Overall, the study contributes practical insights into fostering successful collaborations, showcasing their potential to drive innovation, growth, and market expansion for both individual companies and the broader business network

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Addendum

Letter of Acceptance



Urbino, 29 novembre 2023

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Con la presente si attesta che il saggio scritto da **Matteo Dominidato** dal titolo "Beyond Size: tracing the development of a Startup and Medium Sized Company Relationship and the influence on the business network" è stato accettato dalla rivista Piccola Impresa/Small Business in data 28/11/2023 ed è in corso di pubblicazione nei prossimi numeri della rivista.
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