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Digital Transformation of the B2B context and the acceleration of Covid-19 Pandemic: an investigation of SMEs and fashion

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SUMMARY

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List of abbreviations

Abbreviation	Full Form
AI	Artificial Intelligence
ARA	Activities, Resources, Actors
B2B	Business to Business
CEO	Chief executive officer
CFO	Chief financial officer
CMO	Chief Marketing
CRM	Customer relationship management
DESI	Digital Economy and Society Index
IMP	Industrial Marketing and Purchasing Group
KPI	Key performance indicator
PNRR	Piano Nazionale di Ripresa e Resilienza (National Recovery and Resilience Plan)
ROI	Return on investment
SMA	Sales and marketing automation
SME	Small and medium enterprises
TIU	Theory in Use

Introduction

The business environment in Italy has radically changed due to the COVID-19 pandemic, which has deeply shaken the world economy and redefined how firms manage their own operational and organizational processes and how they relate to each other and their customers (Mahlamäki et al., 2020; Shet, 2020). The emergency has posed the necessity to change the primary and outdated business assets profoundly; companies have understood the centrality of innovation to satisfy customer needs that are evolving rapidly and moving in highly unexpected directions. The pandemic has been, and will represent for years to come, an innovation accelerator creating a strong demand for radical transformation for nearly all industries (McKinsey, 2020).

In particular, the emergency has brought essential modifications to firms in terms of digital transformation, especially in the B2B context, still tied to outdated and "physical" business approaches (Ritter & Pedersen, 2020; Osservatorio Digital B2B, 2023). Failure to transform in the big data and technology era makes B2B companies more vulnerable to existing competitors and unforeseen situations. Gaining a leading industry position in digital experience or offering is essential to benefit the customer, drive growth, and respond to competitive scenarios through an ad-hoc approach. In the last years, B2B organizations have understood the importance of integrating and cooperating with technology despite the numerous barriers present before, during, and those that may remain beyond the pandemic, all of which make digital transformation a challenge (Deloitte, 2020).

In a recent Deloitte report, Kane et al. (2020) stated, "The COVID-19 crisis is creating a stress test for the investments that organizations made in digital transformation" (p.3). Researchers agree that the pandemic has encouraged adopting and exploiting digital transformation initiatives, eliminating any resistance to change (Lundin & Kindström, 2023). In general, the value and perceived benefit of digital tools have significantly increased; numerous studies confirm that COVID-19 has been the catalyst for digital transformation efforts, mainly promoting the use of more advanced systems like Artificial Intelligence (AI), big data analytics, SMAs (sales and marketing automation systems), blockchain, CRM and so on (Almeida et al., 2020).

Undoubtedly, the pandemic has only sped up a process already underway and widened the gap between "digital" companies, reactive to change, and "non-digital" ones, which instead struggle to guarantee the operational continuity of their activities. After all, it is now known that those who had at least started a digital transformation process were able to better cope with the emergency. At the same time, those who did not realize the value of technology suffered severe losses, and, in many cases, they were forced to close (McKinsey, 2021).

In Italy, this topic has been felt greatly; according to the B2B Digital Observatory, 49% of Italian companies declared that the pandemic has boosted the activation of digitalization projects, above all in the context of integration and supply chain collaboration. Further confirmation of the centrality of the topic at the moment can be seen from its enhancement in the recent strategies implemented in the PNRR (National Recovery and Resilience Plan) by the Italian government and by the centrality of the Digital Economy and Society Index (DESI), an index of the European Commission which monitors the development of the digital sector of the member countries of the European Union (Formez, 2022). Therefore, it is a current theme that requires more scientific and practical insights to define clear organizational and operational guidelines.

As specified before, digitalization is a complex process that involves shaping and structuring an entire renewal along different dimensions – economic, societal, and cultural (Brennen & Kreiss, 2016) and it is connected with altering value-creation approaches.

Digitalization begins with digitization, defined as the process of converting information from a physical format to a digital version. In this way, it is possible to exploit digitized data to automate processes and make all the information more accessible along the value chain; companies cannot approach a digital journey if they do not improve digitization first (Verhoef at al., 2021). The next step is to exploit technology to adapt the business model and define new opportunities for creating value. It includes the process of converting "old" business models to new digital-mediated ones and understanding the potential of these tools to collect data, identify new opportunities, and make aligned business decisions (Vaska et al., 2021). It provides the integration of digital systems across the entire firm, redefining the ways of working and delivering value to customers; this profound transformation needs to be supported by a coordinated ecosystem, a digital strategy, and specific digital competencies.

Digital transformation usually goes beyond the digitization of resources to impact business strategy, activities, processes, structures, competencies, and culture (Verhoef et al., 2020; Warner & ager, 2019; Chirumalla, 2021). It is mainly a cultural change that requires organizations to continually question the status quo, explore and experiment, and accept failure. It is a multidimensional phenomenon that does not simply mean acquiring and exploiting technologies within an organization but requires a holistic approach rather than a limited view of a single system. The effects of digitalization processes are multi-faceted; they do not entail the transformation of only products, services, processes, and systems, but they extend to a change to the structure and culture of a company (Vrana & Singh, 2021).

Mahmood et al. (2019) were able to rank and identify, from the significant business literature, the key impacts and benefits of digital transformation as follows: value creation, operational efficiency, customer relationship/engagement, new business models, and competitive advantage.

Numerous firms commit the mistake of addressing the issue of digital transformation only in the short term and decide to implement technical and mostly isolated solutions due to contingent situations, as it has happened during the Covid-19 emergency (Rupeika-Apoga, 2022). This denies the holistic and synergic nature of the process; organizations need to develop a digital strategy in a defined manner and convert it into a strategic implementation of the business model.

Digital transformation process is taking place at different levels in the Italian business landscape; according to recent research of the Osservatorio Digital B2B, most of the B2B companies that start pilot projects are large companies (about 12% of the total), followed by medium-sized companies (6% of the total) and small companies (3.5%) (Osservatorio Digitale B2B, 2022). The main reason for this gap can be traced back to the fact that big corporations have greater awareness of digital applications and their advantages, as well as greater purchasing power and the ability to create supply chain ecosystems. As specified before, it generates benefits in terms of production, organizational, and relational approaches for B2B firms.

From the productive level, additive manufacturing is revolutionizing the operational processes using 3D technology and additive materials. It provides tailored, more robust, and lighter components or systems. Companies that exploit additive manufacturing can measure its positive impact on the supply chain, from shorter delivery systems to more precise inventory management, with a high level of flexibility in the operations. Also, smart manufacturing has a central role, therefore aiming to redesign production processes more efficiently; it is based on the support of tools such as IoT and Big Data; it can promote dialogue between machines and IT systems and create more efficient data management systems to guarantee the sharing and exchange of volumes of data (Craveiroa, at al., 2019).

In addition, the use of 3D modeling allows the acceleration and optimization of design and development processes through the digitalization and automation of iterative prototyping, including tests of fit, simulation of performance, visualization of specific characteristics (e.g., color, pattern, and material), and manufacturing details (Papachristou & Bilalis, 2015). This digital approach optimizes resource consumption, decreases production processes, improves design creativity, and reduces costs (Demarco et al., 2020).

Digitalization is also considered a source of organizational stability, facilitating firms to pursue internal efficiency and external opportunities to generate value and increase the market share (Parviainen et al., 2017; Kolagar et al., 2022). According to Kretschmer and Khashabi (2020), digital

transformation produces changes in organizational structures through the evolution of internal processes, considering that they go through a strategic renewal taking agility, flexibility, and resilience. Tools like IoT or Visual dashboards are facilitating the empowerment of organizational approaches, leading to teams having potential tools to organize the flow of work, the continuous exchange of data, the division of tasks, and, in the most advanced cases, to carry on automated tasks reducing the human workload.

Furthermore, digitalization has changed the logic and dynamics in which the interactions between business players occur; digital media now represents one of the main tools for managing hybrid modes of interaction, which now seem to support (in some cases replace) approaches relational "in presence". Technologies such as social media, Virtual and Augmented Reality, CRM, Marketing, and Sales Systems are modifying the structure and essence of social interactions in B2B business contexts (Rindfleisch et al., 2017; Chang et al., 2019). In general, the Internet has changed social communications and behavior, leading to the exploitation of new channels and platforms.

These digital relational modalities, especially during the pandemic phase, had positive outcomes considering restrictions on exchanging goods and managing relationships; digital technologies facilitate connecting with actors within value chains and creating new contacts with different actors and players. The revolution based on the development of online communication and sales channels has reduced the physical boundaries of the firm to reach its customers by combining both digital tools and increasing the richness of customer interaction (Pandey et al., 2020).

Through these renewed relational approaches, digital collaborations are undertaken by companies, and they are based on integrating people, IT systems, business processes, and infrastructure (physical and online) across organizational boundaries to obtain shared objectives. In the actual scenario, digital collaboration represents an essential aspect of innovation by consolidating skills and knowledge that would typically be limited by industry sector and organizational barriers (Romano Jr et al., 2010). However, managing relationships in digital environments poses ever greater complexity and requires new business skills and high initial costs, including those that are intangible (time, competencies); it is, therefore, necessary to know how to efficiently coordinate internal and external interactions with the company (Witell et al., 2020).

The topic under examination is of particular interest both at a theoretical and an empirical level, considering that relationships perform a central function in B2B business contexts, representing one of the main drivers of value creation within firms. According to a dynamic and holistic perspective, value results from the integration of resources between different social and economic players; technology represents an enabler of this exchange, leading to the integration of resources at inter and intra-organizational levels, facilitating companies to interface with actors outside the corporate

ecosystem. Numerous studies and special issues on COVID-19 have highlighted the need to develop new frameworks that explain how companies and other players interact in their ecosystem (Lacka et al., 2020). This is considering that many organizations still encounter difficulties in changing their relational approaches and, in general, their business models to adapt to a transforming environment. (Kretschmer & Khashabi, 2020). There is, therefore, a need both at a theoretical and practical level to understand the patterns, dimensions, benefits, and barriers of this digital transformation process, certainly accelerated by COVID-19.

Without exclusion, this emergency has affected all business sectors at different levels, bringing profound innovations. Among the industries most affected by the COVID-19 pandemic and the related acceleration in terms of digital transformation is that of fashion. In particular, the new socio-economic scenario, such as the proliferation of a contact-free society, the blocking of supply chains, the modification of consumption models, and different external factors during the emergency, boosted the digital transformation of the fashion industry (Fraser et al., 2022). Scholars argue that the integration of technologies into the fashion sector is driving transformative and disruptive changes across the value chain, resulting in more innovative processes, products, services, and business models (Kalbaska and Cantoni, 2019). However, the adoption of digital technologies in the fashion industry has largely remained in an exploratory phase due to various inhibitors and barriers such as financial constraints, limited expertise, and resistance to change (Pal and Jayarathne, 2022; Santos et al., 2020). Despite having among the highest turnovers globally, this industry is not keeping up with technological innovation processes (McKinsey, 2021).

As specified before, the digital transformation of the fashion industry entails the entire value chain in which significant changes occur, mainly in the relationships with customers, in the organization of the entire production line, and supply-chain operations (Arribas & Alfaro, 2018). The COVID-19 emergency has caused tremendous pressure on the textile value chain and the sector as a whole. As far as production is concerned, the direct effects of the pandemic have resulted, on the one hand, in the unavailability of raw materials due to the blockage of international transport, on the other, in the numerous cancellations of orders by professional buyers, in turn affected by the drop in demand. One of the central focuses for fashion firms during the emergency was to rely on customer experience; the need to maintain a connection with the customers to not lose the numerous investments made to improve relationships with clients and their loyalty to brands.

The fashion industry is mainly based on an outdated manufacturing system that needs to be changed. Overall, the fashion industry appears slow receptive to integrating new technologies into its manufacturing processes (McKinsey, 2020). Many practices and production systems have remained untouched for over 50 years, and most of fashion's supply chains are still not sustainable. In most

cases, brands research the lowest prices, and manufacturing practices have become fragmented as companies outsource more of their production to networks of suppliers in developing countries (McKinsey, 2022).

Despite the numerous complexities that this unpredictable situation and the boosting of digital transformation have brought, it has also opened new opportunities to renew the entire value chain (McKinsey, 2020). Investing in digitalization for fashion firms can increase productivity and resilience, improve internal operations, and support processes. Furthermore, digitalization is leading to the spread of new consumption models and, consequently, new business opportunities for companies linked to services. Among the trends affecting the fashion sector in recent times is digital servitization; companies can find, through this new approach, ways to overcome the crisis period and make the most of resources to reposition themselves in the post-pandemic phase (Akram et al., 2022). In fact, the COVID-19 pandemic has highlighted the intrinsic weakness of a sector that still moves according to old logic: producing items seasonally, often in facilities abroad, without having advance feedback from customers and hoping that the items produced will be sold on markets worldwide. According to estimates recently published by Forbes, fashion retail is a sector in which overproduction reaches levels of 30-40% every season, making it extremely expensive from a financial perspective and onerous from the point of view of environmental sustainability (Forbes, 2020). For this reason, as expressed before, the sector is moving on different models, including servitization and digital servitization in the most advanced cases. This is an approach that fashion companies at various levels are undertaking, both the most advanced and the medium-sized ones; advanced digital or industry 4.0 technologies have been valuable means to support manufacturers' transformation from product-centric to advanced service-centric (or product–service–software) business models (Ardolino et al., 2018; Kohtam ̈aki et al., 2020; Suppatvech et al., 2019; Paiola & Gebauer, 2020).

Lastly, it is important to highlight that within the industry, there are strong dichotomies between large industrial groups and small enterprises in approaching the digitalization processes and how they are undertaken. If the former had already channeled and experimented with innovations in technological terms for years, the latter instead struggled, especially in the pandemic phase, to innovate their existing business models and processes. In particular, small and medium-sized enterprises in the fashion sector (manufacturing, apparel, accessories) have been subjected to the most significant pressure in recent years.

The small and medium enterprises (SMEs) sector is one of the business sectors highly influenced by the pandemic conditions (Syamsudin, 2020). As specified by Chan et al. (2019: 439), "Compared with large organizations, SMEs are typically less formal, lean, and flatter in terms of their structure"

and “SMEs are also often hindered by resource limitations and are thus more vulnerable in a hypercompetitive business environment in which disruptive changes abound” (Chan et al., 2019, p. 437). SMEs struggle to respond to changes in the business environment (Neirotti & Raguseo, 2017). The COVID-19 crisis has caused significant losses or temporary closure of business operations. These restrictions and disruptions of business activities have more severe effects on SMEs than multinational corporations, as they are more vulnerable because of a lack of financial and human resources and the lack of advanced use of digital technology (Papadopoulos et al., 2020).

The crisis conditions in the SME businesses, as an economic driver, have become a threat to the Italian national economy; those firms in Italy constitute the most significant percentage of the country’s entrepreneurial fabric. Furthermore, according to the World Trade Organization, SMEs account for more than 90 % of the world’s business fabric, 55 % of the GDP of developed economies and employ 60-70 % of the employed population (WTO, 2016).

To revive this sector innovative solutions are needed. The main priority step is to stimulate “digital curiosity”, encourage firms to expand partnerships, and improve interaction approaches outside their organizational boundaries. In pandemic conditions, SMEs must be clever at seeing opportunities as entrepreneurs who can make peace with conditions by going digital (Kala’lembang, 2021).

Considering the centrality, especially in Italy, of this topic, numerous studies have highlighted the need to research the topic of digitalization of SMEs, considering the effects of the COVID-19 pandemic, which requires maintaining their businesses so they do not sink.

Previous research has predominantly focused on the integration of digital technologies within large corporations (Cenamor et al., 2019) or particularly innovative entities such as digital start-ups and high-tech giants (Ghiezzi and Cavallo, 2020). However, studies specifically examining small and medium-sized enterprises (SMEs) operating in manufacturing sectors, such as those of fashion, are relatively scarce, despite these firms being recognized as innovative contributors to economic growth in many countries.

There has been a lack of targeted investigations into how SMEs leverage new digital tools to innovate their business models and create value in both domestic and international settings. Furthermore, existing studies have predominantly focused on simpler digital technologies like social media, overlooking more sophisticated technologies such as artificial intelligence and apps, which are currently driving firms’ digital transformations and warrant deeper exploration.

Digital Transformation introduces significant uncertainties, necessitating strategic and value creation changes within companies driven by technology (Bouncken & Schmitt, 2022). Therefore, a profound understanding of the influencing factors of digital transformation is of paramount importance, as it represents one of the most disruptive challenges to economic growth in recent times.

Made these premises, it is necessary to highlight that the subject of this thesis project is, therefore, the analysis of the digital transformation processes of the Italian B2B sector, taking into consideration the innovations to relational approaches and then focusing on one of the industries that has undergone the greatest transformation in the latest years of fashion; the analysis is mainly focused on the sector of SMEs. The thesis comprises three papers: (1) the first is a multi-sectorial analysis of the Italian B2B landscape that considers the digital transformation processes with particular reference to relational approaches. After analyzing numerous industries in the first study, it was understood that the fashion industry is one of the most affected by the pandemic, one in which notable changes are being made in digital transformation, particularly the SME sector. (2) In the second paper, the sector above is taken into consideration, and the ongoing digitalization processes begin to be analyzed, taking into particular consideration one of the most innovative trends, digital servitization. (3) The last paper broadens and deepens the analysis of the second one, including the strong dichotomies within fashion companies and the differences between large groups and SMEs; it intends to fully map the level of digitalization of the fashion industry in Italy, thoroughly analyzing the benefits and limitations of approaching technology. Furthermore, four clusters of companies have been identified as capable of representing the current state of digitalization of firms in the sector.

The entire thesis project takes into particular consideration the SME segment, contributing to broadening and implementing the theoretical and conceptual studies and providing practical contributions for the companies above.

- **Paper 1**

The first paper analyzes the digitalization processes of the B2B sector with particular reference to the relational approaches of companies. Few studies have deepened how business interactions are transforming, considering the increasing digitalization boost caused by COVID-19 and how physical and digital approaches will be integrated in this new post-pandemic setting (Corsaro & Anzivino, 2021). Furthermore, the implementation of technology in industrial business relationships carries both positive and negative effects on the relationship, which need to be further investigated (Hadjikhani & Lindh, 2020), given that the changes led by the emergency in the last years are likely to be permanent (Rangarajan et al., 2021).

The paper analyzes how the online dimension has modified social interaction and social behavior, leading to the exploitation of new forms of communication channels and platforms (like social media, visual dashboards, and social CRM), which play a fundamental role in the digital transformation of

businesses also in the B2B context, generating valuable benefits which include customer satisfaction, value creation, post-sales service behavior, sales or knowledge creation. The paper also investigates the barriers and challenges to this process, including the complexity of using digital infrastructures, the costs and related tangible and intangible resources to be used, and, more generally, a business culture that still needs to be updated and open to discovery.
It is a qualitative study based on 28 interviews and two focus groups with B2B professionals; it defines a theoretical-conceptual framework that identifies and analyzes the transformations of B2B companies due to digital exploitation, paying particular attention to the relational approaches in digital contexts as well as identifying the drivers (efficiency of the interaction, coordination, digital trust) to create business interaction strategies.
RQ1: How has the digital acceleration due to COVID-19 affected the B2B sector?
RQ2: What are the changes in relational approaches due to digital transformation processes?

This paper has been subjected to a double-anonymous peer review process, and it has been published on the Journal of Business and Industrial Marketing (Corsaro & D'Amico, 2022).

- **Paper 2**

Digitalization approaches are among the most crucial innovations, especially following COVID-19, and are increasingly frequent among fashion companies; both large groups and startups and SMEs are exploring, at different levels, such activities in their business models (Kohtamäki et al., 2019).
In the fashion industry, the boost of digitalization processes is leading firms to move from product-centric models to digital service solutions (Adrodegari & Saccani, 2017; Ardolino et al., 2018).
As clearly stated by the literature, digital service business models create many benefits for firms (Suppatvech et al., 2019), including reduced re-organizational costs, development of long-term customer relationships, and differentiation of offerings.
The idea of renting, reusing, and recycling an item of clothing rather than selling it is acquiring greater centrality in the global market; the customer pays for the service offered and not for the product purchased. Therefore, different forms of consumption are spreading (Ricchiardi & Bugnotto, 2019), and this facilitates the development of circular and sustainable economy models considering the reduction of raw materials and energy resources used.
Numerous companies are switching from product-conventional logic, based on the centrality of clothing and accessories, to value propositions adopting new business models based on technology and data. Digital transformation facilitates this process, allowing the dematerialization of the offer

and the diffusion of the logic of “value in use” in the fashion sector. Digital servitization approaches may create initial complexity and lead to the expenditure of resources but, in the long term, create benefits for companies, including the reduction of internal reorganization costs, the development of long-term customer relationships, and the differentiation of the product portfolio.

This paper focuses on SMEs, which are considered central from a theoretical and practical point of view; despite the SME segment comprising the majority of the Italian entrepreneurial fabric (Gonda et al., 2020), fewer studies have considered this segment of firms. Furthermore, they are particularly interesting to analyze, considering that they have undergone the most significant innovation processes following COVID-19. They are embracing digital servitization models but with approaches that still need to be updated and advanced.

Digital servitization as a "sub-stream" of servitization studies is in its early research, and no extensive studies have yet been conducted on the fashion industry; moreover, it is a topic that, in addition to having a solid theoretical relevance, has considerable empirical consideration that numerous companies are implementing this business models to meet the mutable requests of their customers (Paschou et al., 2020).

This second study builds upon the first one, as the results obtained in the context of digital transformation of relational processes served as a basis for analyzing innovations in the field of digital servitization. In fact, the integration of digitalization with servitization brings about substantial changes in provider-customer dynamics. A fundamental hurdle for firms embracing digital servitization lies in adjusting and redefining prevailing product-centric relationships (Sjödin, et al., 2020). This is because digital services necessitate providers to assume increased centrality of the customer (Lerch & Gotsch, 2015) by moving from transactional to relational interactions (Reim et al., 2018). Hence, digital servitization tends to foster more intimate provider-customer relationships defined by co-creation logic, long-term commitment, and increased investment in the relationship.

The research has been conducted through a qualitative analysis based on 20 interviews and defines a conceptual model that describes the main drivers for SMEs in adopting digital service solutions in a business context that has profoundly changed following the current pandemic.

RQ1: What are the drivers of digital servitization for fashion SMEs?

RQ2: How are these companies embracing digital servitization?

The paper was presented at the XVIII SIM Conference, and it has been awarded as best selected paper in the category of B2B marketing (Corsaro et al., 2021). For the aim of this thesis, the paper has been

implemented and enriched with new theoretical insights, methodological applications, and practical contributions.

- **Paper 3**

Following the study above, understanding the solid dichotomies and differences between companies of the fashion sector in terms of Digital Transformation, the objective of the third paper is to map and identify the different approaches to digitalization by fashion firms; the particular focus is on SMEs considering that many are still struggling to approach digital-mediated solutions due to their lack of specific skills or marketing expertise which would allow them to adapt to those changes more easily (Dethine et al., 2020; McKinsey, 2021). The goal is to understand the barriers and opportunities to undertake digitalization processes. In fashion studies, the drivers of digital transformation are still unclear, and new conceptual frameworks are required. The lack of clarity regarding the structuring of digitalization processes represents a notable gap in the literature (Stank et al., 2019). This study aims to address this gap by investigating how companies in the fashion industry organize and allocate digital resources to address digital transformation challenges across their operations.

In particular, due to the theoretical and empirical relevance of the question, the paper examines how SMEs operating in fashion are undertaking digital transformation processes through a holistic lens not limited only to the "technology" dimension but also taking into consideration the ecosystem of actors that revolves around the companies above and the contextual external elements.

Thus, despite the cultural barriers and structural and financial complexities (Amankwah-Amoah et al., 2021), SMEs now consider digitalization an ongoing process that needs to be approached and may bring positive economic outcomes (Corò et al., 2021). In particular, those firms understand that during this phase of volatility caused by the effects of the COVID-19 emergency and other exogenous factors, innovating their business models and the advanced use of technology may produce valuable competitive advantages. Indeed, approaching digital transformation for fashion firms is not a choice anymore; many organizations that have not adopted structural changes during the last two years have been forced to close due to the disastrous consequences of COVID-19 (McKinsey, 2020).

The study is based on a multi-method approach: a qualitative study carried out through semi-structured interviews with 25 professionals operating in the Italian fashion sector combined with a quantitative segmentation study involving 207 companies. The research identifies the main drivers of the digital transformation process for the fashion firms and four clusters reflecting different approaches to digitalization and puts them together to highlight opportunities and complexity for companies in the sector, as well as provide guidelines to develop, promote, and implement digitalization initiatives.

RQ1: What are the drivers of digital transformation for SMEs in the fashion industry?
RQ2: How can SMEs within the fashion industry be supported in the process of digitalization?

1.1 Methodology

Due to the multifaced nature of digital transformation, the methodology adopted for the analysis in the three papers is mixed. It is both qualitative and quantitative; it has been used a multi-method approach for collecting different types of data: in-depth interviews, focus groups, secondary data, and online survey.

1.1.1 Research Setting and Data Collection

- Qualitative analysis

In this research stage, in-depth semi-structured interviews and focus groups were carried out with key informants of the sector. The information has been enriched by participating in online webinars and specialized courses. The objective was to analyze the context more deeply and identify the main drivers and barriers to digital transformation approaches (Stavros & Westberg, 2009). Secondary data have been collected through sector blogs and magazines, official reports, public and Istat data.

- Quantitative analysis

It is based on a questionnaire to explore different approaches to digital transformation. It was developed by combining the results of the qualitative phase with critical studies from the scientific and managerial literature on the digitalization of the fashion sector. The objectives of this phase are measuring the level of digitalization of the fashion industry on a large scale, identifying common challenges involved in the digital innovation processes, and differentiating clusters of similar groups of firms in terms of digital needs and desired benefits. The online questionnaire was administered to senior executives and managers of SMEs operating in the fashion industry. Participants were found through a panel provider who specialized in recruiting B2B respondents. A final sample of 207 respondents was obtained.

1.1.2 Data analysis

To analyze the data, different approaches have been used in the three papers; in the first one, an abductive approach was used that compares data and theory. It is a dynamic process that intends to reinterpret a thesis with the empirical data obtained during the research phase (Alvesson & Skolberg,

2009). Abductive research permits to develop or change the theoretical framework before, during or after the research process. In the second and third papers, a theories-in-use approach was used to exploit fashion industry experts' and professionals' experiences and knowledge to extract valuable constructs that reflected the drivers behind digitalization (Zeithaml et al., 2020). For all three papers the frameworks have undergone modifications during the analysis considering the information derived from in-depth interviews, focus groups, online surveys, and secondary data (Gioia et al., 2012). The data analysis conducted in the three papers are summarized in Table 1.

Table 1 Data analysis of the three studies

Paper	Data Analysis	Research Objectives
1°	- It has been used an exploratory approach involving a qualitative phase to find the main dimensions of the digital B2B relationship in the COVID-19 era (Creswell, 2007) - Data analysis carried out through an abductive approach based on a continuous comparison between data and theory (Alvesson and Skoldberg, 2009) - The iteration between emerging themes and the relevant theories from the literature has allowed the identification of first-order codes, second-order themes, and aggregate dimensions to emerge (Gioia et al., 2012). - The theoretical framework was modeled according to data derived from the triangulation of the interviewees, focus groups, and secondary data (Gioia et al., 2012)	- Understanding how the B2B sector has been impacted by the digital transformation resulting from COVID-19 - Comprehending how the digital transformation processes have led to shifts in relational B2B approaches
2°	- Data analysis is based on a theory-in-use approach (Zeithaml et al., 2020) - The theoretical framework has been modified according to data derived from the interviewees, and secondary data (Gioia et al., 2012) - The topics that emerged from the data analysis have been obtained through an open coding approach (Strauss and Corbin, 1998)	- Identifying the factors that are motivating SMEs operating in fashion to adopt digital servitization. - Recognizing the ways these companies embrace digital servitization
3°	- Data analysis carried out through theory-in-use approach (Zeithaml et al., 2020) - The analysis of the interviews has been conducted to generate dimensions and find common topics among all the empirical material that was obtained (Yin, 1989; Eisenhart, 1988) - To understand the different approaches to digitalization, a segmentation analysis was applied that was carried out via latent class analysis (LCA) based on seven variables (Vermunt & Magidson, 2013)	- Tracing the drivers of digitalization for SMEs in the fashion industry - Understanding which support can be provided to SMEs in the fashion industry to facilitate their digitalization journey

PAPER 1

How the digital transformation from COVID-19 affected the relational approaches in B2B

Abstract

Purpose. The purpose of this paper is to understand the main drivers of change in the relational approaches adopted in B2B companies as an effect of the digital transformation processes boosted by COVID-19 Pandemic.

Design/Methodology. The methodology includes a qualitative study based on an abductive approach. Twenty-eight semi-structured interviews and two focus groups have been carried out with sales and marketing professionals from different industries.

Findings. The research defines a conceptual framework that describes what the main changes of B2B relational approach are in a context affected by the Pandemic, as well as its effects. The framework is constituted by three dimensions (1) Efficiency of the Interaction, (2) Coordination, (3) Digital Trust, and 7 sub-dimensions.

Originality/Value. Academic literature has greatly analyzed the transformation of the B2B scenario, less studies have explored how the relational approach is changing due to the digital acceleration caused by COVID-19 Pandemic.

Practical implications. This research also contributes to managerial practice, defining some directions to be fulfilled in a business context affected by the COVID-19 emergency in order to improve efficiency, coordination and trust.

Keywords: digital transformation, B2B, business relationships, COVID-19 Pandemic.

Paper Type: Empirical Paper

1. Introduction

The business context has radically changed in the last few years. Due to digitalization and its impact on contexts of interaction, many market barriers have fallen, and firms' space boundaries are becoming more flexible and permeable (Ramaswamy and Ozcan, 2018; Moravcikova and Kliestikova, 2017). Digital tools, such as social media, IoT, Big data, AI software, social CRM, augmented reality and others (Rindfleisch *et al*., 2017; Chang *et. al*, 2019) are transforming the structure and the essence of social interaction in the B2B context (Pagani and Pardo, 2017; Zaki, 2019).

The digitalization of many marketing and sales processes was already present before COVID-19, leading to a complete rethinking of the role of sales in the management of customer-supplier relationships (Moncrief, 2017). The new sales blueprint moves from product features to customized solutions as well as redefining traditional business processes with the adoption of new technologies. In business market where companies need to constantly be connected to their stakeholders, where the players are looking for new ways to interact and new touch-points, digital relationships have become key to creating value for B2B firms (Steinhoff *et al*., 2019; Mahlamäki *et al*., 2020). This is due to the fact that, similarly to consumers, business buyers are more often searching for products and services online. They are trying to find customized solutions on their own and speeding up the purchasing process, relying on human support only when it is truly necessary, for example in complex and novel situations (Thaichon *et al*., 2018).

When the pandemic hit, the transformation of the digital process was further boosted. Recent research indicates that 80% of B2B players have preferred to carry on with relationships and interaction online (Mckinsey, 2020) and that investments in e-commerce platforms will rise to 85% by 2022 (Selligent, 2020). The COVID-19 pandemic has accelerated digital transformation, including omnichannel selling, inside sales, tech-enabled sales, and e-commerce (Hadjikhani and Lindh, 2021): "Coronavirus (COVID-19) has been a great wake up call. It has clearly demonstrated how fragile business is. It has created disruption in the supply chain both domestically and globally, particularly with respect to food and energy. It is hard to imagine how a business could run today without smartphones, the internet, e-commerce, and Zoom meetings" (Shet, 2020: p. 282).

B2B companies are feeling a sense of urgency in starting this shift and many firms are disoriented on how to enter into the new context and on how to maintain a relational approach by integrating human and digital technologies. Recent special issues on the business transition after COVID-19 have highlighted the need for new frameworks that explain methods of interaction between companies and the other actors in their ecosystem (Lacka *et al.*, 2020). The use of digital technologies has augmented the number of touch-points a company has, leading to the need to manage greater relational complexities (Witell *et al*., 2020). At the same time, these new technologies should provide increased support in coordinating the relationships that firms have to manage considering all the players that make up the B2B ecosystem (Korpela *et al.*, 2013; Shet, 2020), and who have been overwhelmed due to the pandemic situation. The landscape where B2B companies are now doing business is quite varied with few anchoring points. It must also be pointed out that many consolidated relational models in B2C do not apply to B2B companies which were already struggling with the digital transformation before the pandemic hit. At a theoretical level, few studies are exploring how relational approaches are changing, considering the increasing digitalization process caused by COVID-19 and how

physical and digital approaches will combine in this new post pandemic setting (Corsaro and Anzivino, 2021). The implementation of digital technologies in industrial business relationships carries both positive and negative effects for the relationship, which need to be further explored (Hadjikhani and Lindh, 2020), also given that these changes are likely to be permanent (Rangarajan *et al.,* 2021).

The aim of this paper is to discover what dimensions are driving the B2B sales and marketing relational approach in the digital setting, considering the effects of COVID-19. The two main research questions are: How has the digital acceleration due to COVID-19 affected the B2B sector? What are the changes in relational approaches due to digital transformation processes?

It will present a theoretical framework that represents a starting point for a renewed understanding of relational approaches in B2B after COVID-19 as well as a practical guide for companies during the transition process. To reach this goal, two focus groups and 28 interviews were organized with sales and marketing managers from B2B companies in various industries. Data collection was carried out between June 2020 and February 2021, as the pandemic continued to spread.

This study will develop a conceptual framework that explains the main dimensions that have become key in developing a relationship strategy in the B2B digital context as an effect of the pandemic. In this way it contributes to both the debate on digital marketing and selling strategies in B2B, which are fundamental in a relationship-based approach. It establishes a bridge between the two areas that have become fundamental post COVID-19 with the increased acknowledgement that managing digital and physical interactions requires a higher integration between marketing and sales; they are now inextricably linked, no longer making it possible for them to be considered as parallel study streams or disconnected silos inside companies. This research also contributes to managerial practices, as the dimensions and subdimensions included in the conceptual framework represent the key elements to adapt to new contexts of interaction. This can be problematic as companies that do not adapt, risk disappearing in a few years (Soto-Acosta *et al*., 2020; Hartmann and Lusser, 2020; Cankurtarana and Beverland, 2020). A clear understanding of the importance of such dimensions can help managers in conducting a transformation in a more effective way. The article is structured as follows. First a literature review is conducted concerning the topic of digitalization in the B2B context and the influence of the COVID-19 pandemic on business activities. Then, an overview of the methodology is provided including an analysis of the research approach and the data analysis phase. Next, the findings with the description of the theoretical framework are presented. Finally, the managerial implications and with future lines for other researches are indicated.

2. Digitalization in the B2B context

Digitalization can be considered a pervasive force in the marketplace (Hofacker *et al*., 2016). Technologies have created new spaces to establish relationships (Boyd and Koles, 2019) and the economic activities have been transposed from a physical context to a digital one (Yadav and Pavlou, 2014; Bharadwaj and Shipley, 2020). Shet *et al*., (2020) discuss how digital transformation transcends simple digitalization of resources, to encompass the use of digital technologies to engender major business improvements. These improvements frequently culminate in new and revised business models. Thus, digital transformation enables organizations to improve operations and competencies, and increase the creation and delivery of value.

Improvements in business models and relational processes are also facilitated by a data-based approach enabled by the smart use of technology. Digital tools have the potential capacity to grant an innumerable number of information which, if exploited in the correct way, allows to increase operations and business decisions. Data are considered as a driving force that guides efficient choices in increasingly competitive and complex business contexts. However, this approach is not limited to the implementation of the most advanced tools by firms but it requires human capabilities able to interpret information and transform data in useful knowledge for companies. Visvizi *et al* (2021), agree with the idea that integrating digital advanced tools or smart technologies it's not in itself sufficient, since it is necessary to harmonize human and managerial capacities able to extract value from data. For this reason, innovation lead by data-driven approach might be defined as a multi-dimensional perspective that entails both technological and non-technological capacities processes.

It is necessary to reinterpret value creation and innovation processes through the application of a data-based approach. Considering the great amount of information that companies manage to collect, firms can improve decisions and undertake innovative actions.

According to Troisi *et al.* (2021), there are three main layers that can facilitate data-driven innovation for firms that are: Business models dimensions, Value co-creation based strategies and Data-driven orientation. The first one refers to proactive changes by firms in implementation of technology, in the adoption of new management skills or in settling new objectives and goals. The second one concerns the process of exchange and the co-joint creation of value between different actors. Finally, the last layer identified by the authors is connected to data driven culture that considers data as a valuable asset to be integrated in technological infrastructure, in management skills, and in business processes with the aim to transform the single information into useful knowledge for the company.

Digital instruments have also completely redefined the time and space dimensions in which interactions take place (Breidbach and Maglio, 2016; Kunish *et al.*, 2017). In this scenario, resources

can be integrated in every place and in every moment. These tools have become co-creation instruments that greatly influence not only the customer experience, but also the marketing and sales process, creating new digital scenarios (Ordanini, 2001) and new touch-points where business can happen (Følstad and Kvale, 2018; Ramaswamy and Ozcan, 2018; Kotler and Armstrong, 2017). On that point, Corsaro and Anzivino (2021) observed that digitalization has changed the spatial and temporal dimensions of B2B interactions and have proposed a holistic and systemic view of value creation in digital contexts to interpret and manage interactions. B2B buyers, in particular, believe that digital channels are becoming more convenient with the possibility to have immediate access to product characteristics and to customer reviews (Catlin *et al*., 2016) which also increases the level of trust and transparency of the brand and the company itself (Pavlou and El Sawy, 2002; Kumar *et al*., 2020; Chang *et al.*, 2019). Ray *et al.,* (2020) discovered that B2B customers favored *do-it-yourself* technology or live bot chats and texts rather than traditional interactions with salespeople and they preferred digital communication with salespeople only when self-service could not meet their needs. Sellers are facilitated in acquiring new customers by the appropriate use of their media and digital inbound marketing strategies (webinars, blogs, email etc.) (Bharadwaj and Shipley, 2020). Technology helps in finding potential leads, and through customized contents transforms them in effective customers, loyal to the company. In this sense, digital approaches support firms to become more effective in generating customer engagement and finding new business connections.

This change of behavior in B2B customers has led sales organizations to rethink their relational approach in the phases of customer and prospect engagement, go-to-market strategies, and resource integration with other parties.

In particular, resource integration represents the means through which different business players exchange their knowledge and capacities to co-create value (Kleinaltenkamp *et al*., 2012). It emerges a holistic and dynamic perspective of value creation that happens through exchange in a wider and multi-actor system (Vargo and Lusch, 2016; Storbacka, et *al.*, 2016); in this context, value is not the result of individual activities of single firms but it is created through the integration of resources between different social and economic players (Lusch and Vargo, 2014). This process is clearly facilitated by the smarter and more extended use of digital tools that have become sharper, integrating human-like capacities and therefore operating autonomously, without people intervention (Maglio & Lim, 2018). Technology plays a central role in value co-creation and in mediating interactions allowing an easier and more fluid exchange between those actors. In particular, digitalization highly influences inter- and intra-organizational resource integration, allowing also the possibility to connect with unrelated actors or organizations. In this sense, technology is changing the resource integration patterns and the ecosystem in which firms operate (Sklyar et al., 2019).

To enhance this process, the use of social media has increased drastically, even in B2B. Marketing teams use social media to identify and target specific clusters of customers and to create and exchange user generated content (Pandey *et al*., 2020; Agnihotri *et al*., 2016). Sales teams have increased their use as well. Social Selling has taken on an important role in recent years. It is considered an innovative sales practice based on the power of social technology (Tiwary *et al., 2*021) and on the deeper customer knowledge obtained through a high level of interaction (Trainor, 2012). Salespeople can use these tools in a strategic way during all the stages of the selling process, from the acquisition of leads to the final follow-up (Cartwright, *et al*., 2021) and they can adapt different social media channels to different objectives. For example, Twitter is needed to acquire new prospects or to find possible partners, LinkedIn to find out who the decision makers are of a firm and to look for the right people to contact for new business. Initially the use of social media in the sales process was not easily accepted by salespeople (Moncrief *et al.*, 2015) but this has changed due to the ability to develop and maintain networks with internal and external players (Wang *et al*., 2020; Marshall *et al.,* 2012; Järvinen *et al.*, 2012) and the capacity to connect with new international stakeholders and to cross cultures (Quinton and Wilson, 2016). In the past, social media was seen as simply a tool for communication (Leek *et al*., 2016; Swani *et al.,* 2014), while it is now intended as having a role as a relational resource between the entrepreneurial firm and its B2B partners (Drummond *et al.,* 2020).

Selling through E-commerce has also increased dramatically with the pandemic, and a large number of B2B firms have decided to make this shift (McKinsey, 2020). E-commerce platforms are becoming vital for every B2B company as they not only facilitate the exchange of products and services, but they also increase the level of the learning process of customers and the level of service and products offered (Pavlou and El Sawy, 2002; Chang *et al*., 2020; Koponen and Rytsy, 2020). In fact, they allow for the development of a new and more profound relationship with the final customers by maintaining continuous contact and creating a digital dialogue with all the stakeholders. This is outlined by Qi, Chan, Hu, and Li (2020), who in their study define e-commerce as one of the main tools needed to enter the cross-border market, and as a possible solution to overcome the problems of the COVID-19 pandemic for B2B firms going abroad.

Furthermore, the process of creating new business relationships is also highly facilitated by sales and marketing automation tools which allow business customers to connect in new ways and to simplify the marketing and sales processes (Thaichon *et al*., 2018). Post pandemic, 78% of marketing & sales managers interviewed have declared that in the upcoming years they plan to invest in technologies such as CRM, Marketing Automation Systems and they intend to open a proprietary e-commerce (Salesforce, 2021). Among the reasons for such investments is the need to improve the business

customer experience by sending personalized communication, expanding customer service and the activities of cross-selling and up-selling.

The increased use of technology previously discussed in B2B is changing the relational patterns and relational dynamics of many companies. On the one side, most industrial companies depend on long term and sometimes multigenerational relationships between the company, its customers, and suppliers (Parvatiyar and Shet, 2000; Saura *et al.,* 2021). On the other side, the use of digital technologies in B2B companies has made evident the difficulties these companies face in managing relationships with the community, the employees and the customers (Shet, 2020). Many studies have been dedicated to the understanding and management of business relationships, both from the IMP approach (Hakansson and Snehota, 1995; Gummesson and Polese, 2009), service science (Grönroos,1994; Barile and Polese 2010) and Service-Dominant Logic (Lusch and Vargo 2006; Lusch *et al*., 2007). Prior research in the IMP stream related to the impact of digital technologies on business relationships has led to the revision of the traditional ARA (Activities, Resources, Actors) in terms of activity links, ties to resources, and actor-bonds-centered digitalization (Pagani and Pardo, 2017). Challenges related to digital platforms can be found on an individual level as well as on an intra-and inter-company level (Rajala and Tidström, 2019). For instance, Hadjikhani and Lindh, (2021) demonstrated that digitization in industrial relationships has a positive direct impact on commitment by increasing cooperation. They also noticed that digital use may increase uncertainty and negatively impact commitment.

The opportunities for sharing data enabled by digital technologies are a further element that generated uncertainty in B2B relationships, creating new issues in between collaboration and competition, especially when the pandemic hit. Crick and Crick (2020), who adopted in their study a resource-based theory and the relational view, state that coopetition strategies are increasingly used to handle the COVID-19 pandemic.

Therefore, the effects of digital technologies on the marketing & sales relationship are still controversial. Whereas most B2B organizations have taken a more cautious approach in deploying digital technologies, the COVID-19 pandemic has compelled sales organizations to adapt quickly and embrace digital transformation (Rangarajan *et al*., 2021; Kostis and Ritala, 2020). In the current literature, there is an evident gap in the joint study of digital and physical interactions between B2B companies and their relationships with other companies (Alonso-Garcia *et al.,* 2021).

The COVID-19 pandemic has changed the way individuals in the sales force interact with customers and with business-to-business (B2B) organizations (Rangarajan *et al.,* 2021). There is an urgency in B2B academic research to deeply examine organizational processes as well as sales and marketing practices in light of the COVID-19 pandemic, and also to give firms managerial tools to navigate this

difficult period. At the moment, less knowledge exists with respect to the management of business relationships mediated by digital aspects, which is becoming an increasingly more relevant issue after COVID-19. This study intends to systemize the relational approach of B2B firms focusing on all the dynamics and processes that firms face daily, considering it as the primary interconnection between two main aspects, human and digital.

3. Methodology

3.1 Research approach and data collection

It is adopted an exploratory approach involving a qualitative phase to find the main dimensions of the digital B2B relationship in the COVID-19 era (Creswell, 2007); this technique has been useful to investigate phenomena, to propose new ideas and to develop a conceptual framework which helps define relationships in a digital B2B environment.

The study is based on an abductive approach with the aim to generate insights from qualitative observation of phenomena. It is a fluid process that intends to reinterpret a thesis with the empirical data obtained during the research phase (Alvesson and Skoldberg, 2009). Abduction stands out as particularly adept at uncovering novel insights (Kolko, 2010), playing a pivotal role in assisting researchers in their quest for innovative discoveries (Reichertz, 2004), thereby facilitating the process of theory-building. Abductive reasoning facilitates the redefinition and conceptualization of existing knowledge to focus on and elucidate a new concept. Data are continuously scrutinized in conjunction with existing literature. This iterative process facilitated a better understanding of the digital transformation of B2B relationships, ensuring that data was interpreted taking into consideration prior research.

Nenonen et al. (2017) pointed out that abductive methodologies improve the quality of research results by generating concepts that are more practical and comprehensible in real-world scenarios compared to those resulting solely from theory. Abductive reasoning is employed to make logical inferences and construct theories (Kovács & Spens, 2005). This method has been used by the researchers for this study to have a contextual analysis of material information and theoretical ideas with the goal of extracting new themes in the field of digital B2B relationships.

The principal literature on the topic of digitalization in B2B firms was analyzed considering the COVID-19 situation and then enriched it through the findings. The initial aim was to understand how the relationship has been transposed from physical to a digital context and which objectives B2B professionals have in this "new" form of interaction. The research then moved onto analyzing the main themes and the key points of this relationship considering the COVID-19 pandemic that has redefined the way of carrying out business. In this process of alternating literature and empirical data

it became clear that the study could work in a conceptual framework that describes the business relation in the digital B2B environment.

The qualitative research has been developed through the use of projective techniques, useful for going in-depth and carefully sounding the opinions of the respondents, thus allowing a business to understand the real essence of the digital B2B relationship, the expectations of B2B professionals during COVID-19, as well as to understand if there are areas for improvement of the relationship as it is structured today, by comparing the opinions of experts in the sector.

The qualitative phase was carried out through semi-structured interviews and focus groups done between June 2020 and January 2021 (see Table 2).

Relevant academic literature agrees that the combined use of focus groups and interviews is useful in understanding different representations and conceptualizations of the phenomenon under consideration (Lambert and Loiselle, 2008). In fact, an increasing number of studies, even in the B2B sector, are using this type of methodology to obtain a more comprehensive view of the subject and to reinforce the validity of their findings (Mittal *et al.*, 2021; Kooli *et al.*, 2016).

Table 2 Data sources and applications

Data Source	Type of Data	Applications
Business Documents	**Business reports, business presentations (2020-2021)**	Understanding the principles of digital transformation and B2B relation in the COVID-19 era.
Interviews	**First round (2020)** Interviews of 16 sales and marketing professionals (16 hours). Profiles detailedin Table 2, #1 to #16.	Gaining how the B2B relation arises in a digital environment and how the COVID-19 has influenced it.
	Second round (2021) Interviews of 12 sales and marketing professionals (12 hours). Profiles detailedin Table 2, #17 to #28.	A deeper analysis of the B2B relational approach in a second phase of the COVID-19 Pandemic, trying to understand the main dimensions of this process.
Focus groups	**2 Focus groups (2020)** Total of 14 sales and marketing experts (4 hours). Profiles detailed in Table 2, #29 to #42.	Validating the insights obtained during the interviews.

For the qualitative analysis, information-rich men and women were identified from a wide range of industries and different areas of the market.

It was used a purposeful sampling technique to collect all the empirical data. Purposeful sampling involves deliberately selecting participants based on specific characteristics, knowledge, experiences, or other criteria. It is a widely employed technique in qualitative research aimed at identifying and selecting information-rich cases to optimize the use of limited resources (Patton, 2002). This method permits the pinpointing and choosing of individuals or groups with significant expertise or firsthand experience related to the topic under investigation (Cresswell & Plano Clark, 2011). Alongside expertise and experience, Bernard (2002) emphasizes the importance of factors such as availability, willingness to participate, and the ability to articulate, express, and reflect upon one's experiences and opinions.

To grant the credibility of the data, diversified categories of participants from various industries were surveyed, covering a broad spectrum of company sizes, from small (e.g., 10 employees) to medium-sized (250 employees) and large companies. The interviewees and the participants to focus groups were selected for having a key role in the marketing or sales department, or for being the CEO of an Italian B2B company. This was done to have a different perspective of the same phenomena and to define a complete vision of the theme (See table 3).

Given the exploratory nature of the study, the research was conducted across multiple sectors to identify and analyze common drivers. The goal was to include the largest number of industries in the study to have a clearer and more complete reference framework for the B2B landscape. Moreover, the variety of contexts represents a resource for identifying common factors between the various industries and prevents the mistake of considering final findings as conclusions that result as true for only some sectors. Through this approach it was possible to identify a multifaceted perspective of the phenomenon analyzed.

Table 3 Participant profiles

#	Job Position	Gender	Seniority (in years)	Industry
1	Sales Director	Male	30	Food
2	Marketing Director	Female	12	Food
3	Marketing Director	Male	15	Digital Services
4	Marketing Director	Male	19	Fashion
5	Sales Manager	Female	8	Food
6	Sales Director	Male	18	Beauty
7	Sales Director	Male	10	Beverage
8	Marketing Director	Female	15	Gas service
9	Sales Director	Female	8	Large distribution
10	Marketing Director	Male	14	Fashion

11	Sales Director	Male	14	Pharmaceutical
12	Marketing Director	Female	15	Consultancy
13	Sales Director	Male	20	Large distribution
14	Sales Director	Female	8	Iron production
15	Sales Director	Male	12	Automotive
16	Marketing Director	Male	15	Financial
17	Sales Director	Female	16	Financial
18	Sales Director	Male	6	Travel
19	Sales Director	Male	5	Financial
20	Marketing Director	Female	20	Manufacturing
21	Sales Director	Female	35	Insurance
22	Marketing Director	Male	20	Metal manufacturing
23	Key Account Manager	Male	7	Beverage
24	Marketing Director	Female	15	Digital services
25	Sales Director	Male	11	Hospitality
26	Sales Director	Female	12	Pharmaceutical
27	Sales Director	Male	12	Fashion
28	Sales Manager	Male	15	Large distribution
29	Sales Director	Male	16	Fashion
30	Marketing Director	Female	15	Financial
31	Marketing Director	Female	4	Automotive
32	Sales Director	Male	5	Food
33	Sales Director	Female	6	Pharmaceutical
34	Sales Director	Male	8	Healthcare
35	Marketing Specialist	Female	5	Food
36	Sales Director	Male	7	Financial
37	Sales Manager	Female	12	Fitness equipment
38	Sales Director	Female	15	Publishing
39	Marketing Director	Female	8	Financial
40	Sales Director	Male	6	Advertising
41	Marketing Manager	Female	16	Food
42	Sales Director	Female	19	Beauty

28 semi-structured interviews were conducted through the use of Zoom platform considering that the COVID-19 social distancing policies compromised the possibility to carry out in-person activities. The decision to do semi-structured interviews allowed the participants to go more in-depth in issues which were emerging as the interview progressed. All interviewees were asked to keep their cameras and microphones on during all the phases of the interviews. One week prior to the meetings, each

professional was informed with regards to the main topics that would be discussed. The questions were chosen considering the preliminary literature review and the study of business cases. The questions were open ended or semi-structured and they mainly regarded the way in which relationships have changed with digitalization during the COVID-19 pandemic; which critical elements emerged in interacting with customers and other stakeholders and how they have been managed; which are the main technologies implemented and the areas of investments in the near future. The interviews lasted one hour and were recorded and transcribed by the authors. Then the managers were contacted a second time to check the reliability of their comments. At the conclusion of the research, a report was sent to each interviewee containing the main points of this study.

Two focus groups were also organized involving 14 B2B professionals to corroborate and certify the insights obtained through the interviews. To ensure an easy and fluid interaction, each focus group had a maximum of 8 people. The meetings were conducted virtually through the use of Zoom and lasted an average of 2 hours. Both focus groups were moderated by the authors that also chose the main themes of the discussions. The topics were digitalization in the B2B context and the evolution of relationships, the possibility of investments in technology in the near future, and the effects of the pandemic on business realities. The focus groups were approached in an informal way with the support of the researchers to facilitate the process. The moderators tried not to excessively drive the discussion and the participants were free to communicate their opinions, their visions, and to offer examples. The conversations with the focus groups were recorded through Zoom to guarantee that no useful research information was lost.

When the 28 interviews and the 2 focus groups were concluded, it was clear that the saturation point on the topic was obtained (Strauss and Corbin, 1998). Data saturation was achieved as no new insights emerged from the patterns observed. This nearly meets the guideline suggested by Creswell (2007), which recommends conducting twenty to thirty interviews to develop a well-saturated theory.

It is also included a table that outlines the strengths and the weaknesses of the research method used to conduct the analysis (table 4).

Table 4 Strengths and Weaknesses of the research method used

Items of the research	**Strengths**	**Weaknesses**
Investigating the relational ecosystem of B2B firms	Wide-ranging exploratory research	Non-statistical reliability of the results
Analyzing digital transformation processes of B2B firms	Broader analysis of the reference context	Possible influence by the researcher's perspective on the analysis
	Identification of latent constructs	Risk to gain misleading findings

Examining the effects of Covid-19 on business B2B relationships	Generation of theories and conceptualization of the phenomenon In-depth information on individual cases Flexibility in research processes Closeness to data	Time-consuming analysis Social and unconscious biases of the interviewees

3.2 Data analysis

Interview analysis was conducted with the aim of developing categories and looking for common topics among all the data reached (Yin, 1989; Eisenhart, 1988). The abductive approach also influenced the phase of data collection creating an exchange between theoretical information and empirical data. Analyzing the material obtained during the interviews and the focus groups and during the coding process it was possible to extract the main dimensions of B2B relationship in a digital environment.

The analysis carried out was based on a manual coding procedure considering that being a research on multiple industrial sectors, it was necessary an approach that could permit to concentrate on a general context, to have a holistic vision of the phenomenon that integrates and interconnect heterogeneous processes; in this sense, manual coding permits to transcend to more conceptual and theoretical levels of analysis (Saldaña, 2021). Furthermore, this approach, more than the software coding, enables a direct and meaningful interaction with data that are continuously handled by researchers who can therefore constantly compare them, change view perspectives, and develop different interpretative insights. In this kind of research, it has been essential to analyze every possible interconnection and relationship between information, to move from micro- to macro-view perspective with the aim to generate theory or conceptualization. Furthermore, manual coding permits to focus and include in the analysis also non-verbal language like body language, tone of voice, the inflection, the feelings of the participants (John and Johnson, 2000), that, in the same way, have produced important meanings for this research.

The analysis has been conducted in a continuous comparison to improve the reliability, the systematicity and the transparency of the coding process promoting reflexivity and a dialogue to enhance the trustworthiness of the results.

The analysis follows three different stages, in order to identify the main themes and the dimensions of the B2B relationship in a digital environment. Figure 1 illustrates the result of the final coding structure with the conceptual framework.

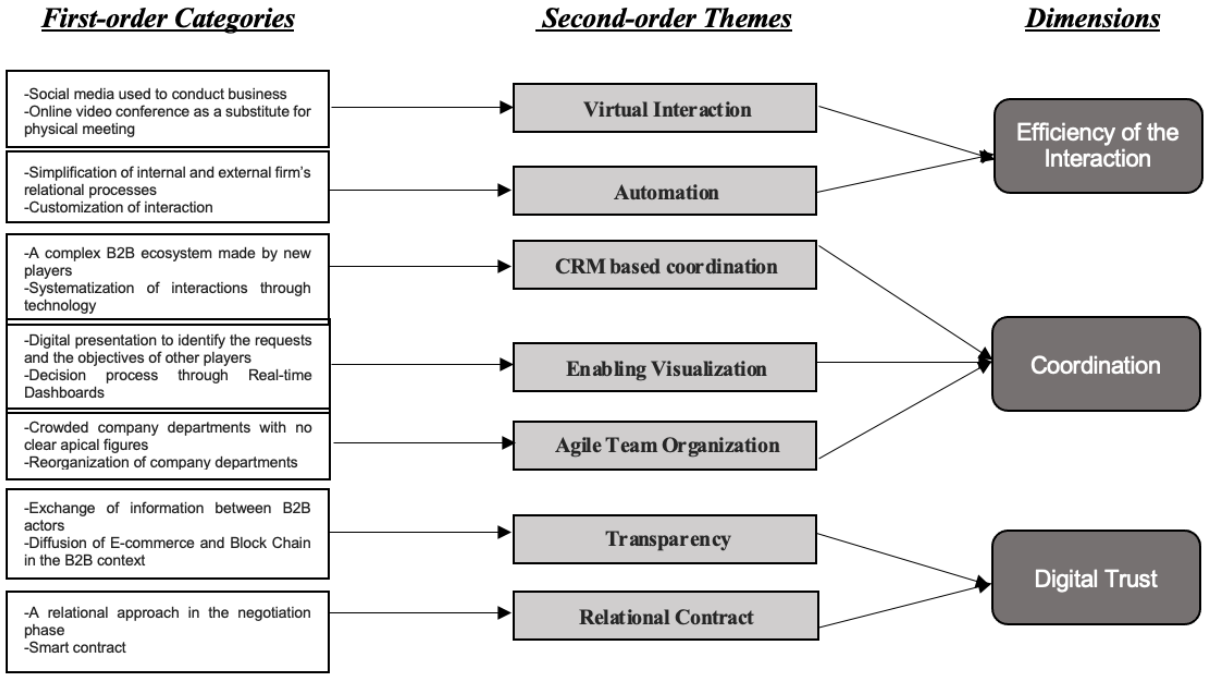

Figure 1 Coding structure and conceptual framework

Open Coding: Following the approach of Gioia *et al.,* (2013), the empirical information obtained during the interviews and the focus groups were analyzed to identify initial categories. Then numbers were assigned to each category and similar codes were grouped to obtain 14 first-order categories.
Axial Coding: In the next step, it was further analyzed the relationships between the open codes (Strauss and Corbin, 1998). To do so, data obtained during the qualitative phase were alternated with data from existing studies, trying to link emerging themes to past literature (Gioia *et al.,* 2013). First order categories were then grouped into second order themes. For example, the first order categories "simplification of internal and external firm's relational processes" and "customization of interaction" have been clustered into the second-order theme "automation" as they reflect the fact that B2B firms are increasingly using technology and in particular SMA's tools to manage business interactions.
Selective Coding: Finally, the second order themes were merged in core categories (Creswell and Creswell, 2018), with the objective of identifying a conceptual framework that explained the main dimension of B2B relations in a digital context considering the acceleration caused by the COVID-19 pandemic. Second order themes were connected with data deriving from the empirical research to obtain dimensions that present a high level of theoretical abstraction. For instance, the second order

themes “CRM base coordination”, “enabling visualization” and “agile team organization” have been aggregated into the higher-order dimension “coordination” as they represent ways to increase alignment in the relationships between B2B firms or players.
The findings were validated by the data obtained through the interviews of multiple participants to verify the veracity beyond a single case or industry. It was also applied the comparison method in all the interviews and the focus groups, identifying the main themes and comparing them to verify the consistency of the findings and underlying the common themes and the differences.

4. Findings

The analysis resulted in a conceptual framework that describes the main dimensions of the digital B2B relationships. In the framework theorized, there are three higher dimensions that represent the core elements of this study with a significant level of abstraction, and they are: Efficiency of the Interaction, Coordination and Digital Trust; each of them present particular sub-dimensions: Virtual interaction, Automation, CRM base coordination, Enabling Visualization, Agile team organization, Transparency, and Relational Contract.

4.1 Efficiency of the Interaction

This first dimension has been extracted analyzing how the B2B professionals maintain and create relationships in a digital environment after COVID-19.
It was observed from the interviews that during the initial phases of the pandemic, specifically small or medium-sized companies did not have the tools, the skills, or the culture to manage business relationships exclusively online. In many cases, in fact, they simply implemented the approaches and the modalities they used in the physical world to the digital setting. For instance, they were not ready for the immediacy of communication and their web calls with customers tended to last very long. With the persistence of the pandemic, however, even the aforementioned companies understood the potential of digital and began to adapt and to use it to empower their traditional practices.
In this regard, firms discovered the positive effects that digitalization could generate and for this reason technology was then perceived as an opportunity, a different way to establish new business relationships, to conclude new deals, to connect with different and more international stakeholders by reducing the costs and splitting time between all activities. Digital systems facilitate B2B firms in managing and handling interactions with the main players of their network (Pagani and Pardo, 2017; Hofacker, *et al*., 2020).

> *“We were very skeptical to digitalize most of our asset and processes, we were wrong. During the pandemic and the lockdowns, we immediately understood the validities of these*

instruments and the costs that we managed to cut. Digitalizing many processes allowed us to establish new relations and we managed to find new business interlocutors" (Sales manager, large distribution company).

"During the COVID-19 pandemic, the only solution to maintain and create new business interactions has been the digital one, we discovered that we could increase the efforts in using those technological tools. We managed to connect with our stakeholders and to find new customers that without technology would never be connected. Technology allowed our firm to increase the efficiency of our interactions" (Sales director, beverage company).

Coding the interviews and the focus groups it was found out that the digital tools mainly used to increase efficiency in the relationship are: social media, Social CRM, digital platforms for meetings, Artificial Intelligence, Automation Systems, IoT. These technologies represent the way in which marketing and sales professionals can increase the efforts of their activities, diminishing the time spent on them and reducing costs.

Analyzing the new essence of the digital interaction, as described above, and going in depth into the interviews and the materials of the focus groups, 2 sub-dimensions have been extracted that explain the importance of the efficiency of the interaction in the digital B2B context and they are: Virtual Interaction and Automation (See table 5).

4.1.1 Virtual Interaction

The first sub-dimension is Virtual Interaction, which concerns the new way in which B2B players communicate in the COVID-19 era and how digital tools can increase the efficiency in interacting with business professionals. This has been extracted by analyzing the environment in which B2B actors cooperate. In this difficult panorama, business professionals claim that there is an urgency to constantly remain connected, to nurture business in every situation and to avoid any time dispersion. For this reason, the use of email and phone calls is dropping significantly; B2B players prefer to use social media such as WhatsApp to communicate in business contexts because they are in immediate contact with their partners. In fact, as stated in various interviews, the increased use of smartphones by managers is pushing the management of company interactions towards a more technology centered way. The professionals understood how the use of traditional tools brought the delay of economic processes, in some cases they affirm that they often waited for days before receiving an email or a phone call to close deals with their customers. This situation is no longer acceptable with the

pandemic emergency which has boosted business processes and demands immediate interaction to push business.

> *"At the beginning, I was a little skeptical of using social media to conduct transactions, since they are not proper business tools and they have been created for other reasons, but now I cannot do without them, they are becoming the main way to communicate with my dealers, my customers and also with my team. In this way we can nurture affairs only with our smartphone obtaining the same goals" (Sales Director, beverage company).*

> *"I started to use social media to conduct business affairs given that I understood I could better communicate the sense of urgency to my counterparts. In some cases, I waited for an email for days without receiving any response, or I spent hours on the phone waiting for my counterpart to finally decide to respond. With the pandemic, it is not possible. I need to know in an hour whether I have closed the deal, and using this new chat is perfectly feasible. Furthermore, people using social media are "forced" to respond, in as much as I can clearly visualize whether they see my communication and they decide to ignore it, and when it happens, I immediately decide to look for new deals, new firms or new counterparts" (Marketing Director, fashion company).*

Social media is also substituting the "old" media to communicate inside companies; marketing and sales teams are experimenting with new ways of interaction based on social tools. With the introduction of remote working and with the social distancing policies inside offices, it is necessary to find alternative methods to always be in contact, and social media perfectly meets this need. The pandemic situation brought with it the risk of isolation, while the creation of common chats and the continuous flow of messages and interaction recreated the "in office" atmosphere giving a valuable and faster tool to connect entire departments.

> *"I am the head of my department and with the forced lockdowns I have had to rethink the ways of interacting with my team. Email or phone calls create too much confusion after all, it is difficult to communicate at the same time with all of my team and it takes too much time. For this reason, we experimented with social media in daily activities, now we make decisions and we easily communicate through them creating common chats and discussions" (Marketing Director, financial company).*

Another important approach that derives from this sub-dimension is the new way to conduct business meetings: interaction has been transposed online. With the pandemic, it has become the rule and the

only way to carry out business and to nurture relationships. It was already a trend in previous years to have virtual business meetings, however this trend has been accelerated by COVID-19 because of the forced distancing policies. This new form of techno-mediated interaction is based on digital platforms (like Zoom or Microsoft Teams) which allow visual contact in an innovative way.
As stated by the respondents, the online experience has become the main way to continue ordinary activities and to start new business. From the interviews it was clear that, especially small companies, struggled in the beginning to organize a new visual business approach, being that they were used to having direct contact with the interlocutors and they had not been given the proper tools to digitally manage these new meetings.

> *"At the beginning of the pandemic we were very much in trouble, and we did not know how to carry on with business activities. We used to travel a lot to go to our customers and close deals, but with COVID-19 it was impossible. We ignored the existence of platforms like Teams or Zoom and we used to call our interlocutors, but it was a limited interaction and we were not able to gain positive results" (Sales Director, pharmaceutical company).*

> *"When COVID-19 started, we were obliged to have meetings online but it was very complex; In face-to-face interactions I can understand their approach through facial expressions and their emotions through body language or vocal intonation, if they do not agree or any signs of hesitation or fear. With digital tools, it is much more complicated" (Sales Director, food company).*

However, after a period of running these meetings, in most cases, professionals state that they would never return to the "old" normal. They have discovered the efficiency of digital meetings as they offer more benefits and a significant cost reduction.

> *"During the COVID-19 pandemic, we could only have meetings online, it has been great for our company, since we have managed to have more meetings a day with more international interlocutors reducing the time of each one and avoiding any delays that we had had before. We were only concentrating on obtaining maximum effort in the minimum amount of time" (Sales Director, fashion company).*

> *"We have increased the efficiency of interactions in our company, cutting many costs, considering all the travel, all the hours spent to reach clients that are no longer necessary.*

With this new method you can empower your time" (Sales director, pharmaceutical company).

Respondents underlined how in person meetings are longer than the online ones, with a high dispersion of resources and time, and in many cases, they did not obtain the desired results. With the digitalization of these interactions, it has been possible to concentrate more business in the same day and to reach the maximum effort in the minimum amount of time. B2B professionals outline how people are concentrated and get straight to the point so as not to complicate the interaction. There are no longer time dispersions and companies have easier access to new markets and economic opportunities, expanding their businesses and their networking (Fraccastoro *et al.*, 2021).

4.1.2 Automation

From the coding process it was clearly stated that B2B professionals have less time to nurture business relationships because of the COVID-19 pandemic which has greatly expanded the economic landscape and has them dealing with new complex figures. For this reason, managers have decided to simplify their relational approach with the automation of certain activities. This permits to avoid wasting time in repetitive actions and B2B professionals can concentrate their forces on closing deals and on focusing more on customers at the same time. As stated in interviews, automation systems allow managers to look for prospective customers and trace their buyers' journey, to shorten the sales process by automatically sending the most relevant information, to revitalize dormant leads through email retargeting campaigns, and to save time by sending only qualified contacts to the sales team. This approach requires the mediation of technology which can substitute the human touch with mechanical tasks (Mero *et al*., 2020). The human interventions happen at a more strategic level by addressing the strategy the machine should follow, and which is enhanced by artificial intelligence.
The introduction of Sales and Marketing Automation Systems (SMAs) is a widely discussed topic among all the companies interviewed. Most large companies considered for this research had already presented SMAs in their organization and had understood the effects that this tool had brought to their relational approach.

"The topic of automation has always been discussed in my firm, but no one wanted to invest in it. With the arrival of the pandemic, it has become vital to continue our business activities. We did not have time to dedicate to certain activities, our work had suddenly become more complicated. We had to face unthinkable problems; for this reason, the only solution was to incorporate an automation system in our firm. The software has helped us in repetitive activities, in attending to more customers and fixing the KPI's. In this way, we could take the

leads to a more advanced stage, closing the deal easily by skipping the preliminary phases" (Sales Director, Gas company).

"Introducing SMAs in our organization has helped us to automate the relationship processes at the initial phases of the buyer's journey. This tool takes care of and personalizes every interaction, increasing the efficiency of our business approach" (Sales Director, large distribution company).

Instead, the perception of automation systems in some small and medium-sized companies is different, they consider these tools too expensive or ineffective for their business.

"For our firm, Sales and Marketing Automation Systems, are ineffective, they are too advanced. We do not have the digital culture and the resources to adopt this kind of Technology. Our Marketing and Sales Processes are not so developed to require these kinds of tools"(Sales Director, hospitality Company).

"We know the potentiality of automation systems, but we are a small family company we do not have so many contacts to look after; for this reason, we prefer to manage the interaction with our customers and stakeholders personally. However, if our business grows the introduction of a SMAs will become required"(Sales Director, food company).

However, in most of the cases, despite the doubts of some small and medium-sized companies, B2B players understand how these tools enable the actions of B2B firms and increase the efficiency of the relationship approach.

The automation systems also simplify the companies' internal relationship processes by creating new ways to interact and cooperate. In fact, SMAs represent valid tools to directly interact with and to define common objectives and KPIs by creating a more fluid connection between company departments. Most of the marketing and sales professionals that interviewed claim that these tools permit to increase the level of communication within the company and to define common strategies.

"Automation systems have helped our sales and marketing team fix common goals and KPIs, to share information and save resources in repetitive tasks. We can directly interact and communicate through these tools. We manage to cooperate easily without wasting time" (Sales Director, large distribution company).

"Introducing SMAs has helped the internal departments of this company (like Sales and Marketing) in communicating better, defining common strategies and avoiding creating company silos that work separately without interconnection" (Sales director, beverage company).

From these interviews, it is clear how automation is a very crucial topic in modern markets; it substantially increases the efficiency of interaction not only outside the firm, with clients and customers, but also inside the company within departments.

Moreover, with the COVID-19 pandemic, the centrality of customers has become even more dominant than before, for this reason, companies are required to have a tailored approach in developing relationships with them; automation systems represent a valid ally in reaching this objective for its capability to personalize each contact with the main characteristics of interlocutors.

Table 5 Efficiency of the Interaction: Selected Evidence

Second-order themes	**Selected evidence on first-order codes**
Virtual Interaction	*Social Media used to conduct business*
	We use social media to find customers and to nurture them. They are well designed and they permit to have an immediate interaction. (#16)
	With social media like LinkedIn, we can immediately have access to central information regarding our prospect partners and to understand if we can build a valuable relation. (#36)
	Social Media represents the future to entertain business interactions. We do not use any-more email or phone calls, they take too much time. We need tools that allow a faster relational process. (#38)
	Online video conference as a substitute for physical meeting
	We have been using Platforms for meetings for years, they are very efficient systems. Wecut off all the costs of travels, of business trips, but we maintained the same level of interaction. Initially it was very difficult to convince our interlocutors to use online tools. However, with this pandemic they all have been forced to adapt to this new reality and they have discovered how it is positive for economic activities. (#19)
	When COVID-19 started I have been obliged to conduct business meetings online, it has been very difficult for me, at the beginning I did not know how properly use those tools and platforms, and I thought I could lose many affairs. Now it has become normal for meto conduct meetings online. (#20)
	Platforms like Zoom or Microsoft Teams have become fundamental with the arrival of the COVID-19 Pandemic. We used to travel a lot to meet personally our customers, nowwe can easily conduct affairs in our offices. (#10)

Automation	*Simplification of internal and external firm's relational processes*	
	COVID-19 pandemic made much more difficult the relational activities with our customers, but also internally between firm's departments, for this reason we have introduced Sales and Marketing Automation Systems to simplify processes. This makes easy our daily work and it increases the quality of our relational capacities. (#22)	
	We have to face hundreds of interactions daily; we needed a tool to systematize them and to substitute our approach in the initial phase of the lead nurturing. (#15)	
	Customization of interaction	
	We are a big company, with many customers and we have continuous interactions and we wanted to personalize each contact, for this reason we opted for a Sales and Marketing Automation System that perfectly allow to tailor all our contents for every kind of clients. (#41)	
	In our lead nurturing campaigns we want to customize every interaction to increase the possibility to acquire new customers, doing it personally was becoming very complex, for this reason we adopted a Sales and Marketing Automation System (SMA's). (#37)	
	Customization is becoming fundamental with COVID-19, clients need personalizedinteractions. (#19)	

4.2 Coordination

Another dimension that is affected by the digital relationship in the B2B context is coordination between internal and external players and relationships that coexist in the B2B ecosystem. This approach becomes even more complex to achieve success in a digitally mediated environment considering the "remote" nature of business interactions, the exclusive use of virtual communication instead of face-to-face interactions and more in general, the difficulties in finding agreement between multiple players with different interests.

To obtain coordination and to establish profitable relationships with other B2B players, it is necessary to align your interests with the interests of the other party and, in a techno-mediated environment, this is facilitated by the use of technologies like digital matching platforms which are increasingly used in online events like virtual trade fairs. They are sophisticated tools that, through a preliminary analysis, create connections between players with similar interests, thus effectively maximizing coordination.

In particular, B2B business actors need to understand what kind of processes can be developed together with other players and this requires coordination inside the firm (Sleep *et al.*, 2020) and, at a more general level, coordination with the network of players that influence the B2B market.

This dimension has been clearly underlined in the interviews and by deeply analyzing the empirical material, three sub-dimensions have been extracted: CRM base coordination, Enabling visualization, Agile team organization (See table 6).

4.2.1 CRM based coordination

In the interviews, B2B players stated how business scenarios are becoming more selective, each firm having to face and develop more relationships than in the past, considering phenomena like international networking and global business deals. It has increased the number of forces and players that act within the business scenario, creating complexities in the approach to relationships. In other words, the number of interests and stakeholders that revolve around each company has increased significantly, overwhelming the entire ecosystem of B2B firms. Businesses have to face more interactions with a variety of interlocutors which present diverse requests and priorities. Furthermore, these new business players are becoming more complex to deal with than before; as stated in the interviews: intermediate figures with specialized functions in marketing, sales or in management engineer are born and they require a higher level of competences; customers are much more informed and prepared than in the past, they have developed new characteristics and they have raised the level of products and services that they require. This situation has been complicated by the digital transformation and by the COVID-19 pandemic, which have introduced new figures and new players in this scenario, creating a new digital and more complex ecosystem. This overcrowded panorama needs to find an order; firms should research new ways to coordinate their internal and external players.

> *"It is much more complicated to deal with all our interlocutors with a high level of interest, there are too many players and too many complications in this new panorama. Our interlocutors are much more prepared than in the past, they have developed new characteristics; sales and marketing skills are no longer sufficient to survive in this context. We needed a new way to coordinate in order to survive and to simplify the approach to relationships"* (Marketing Director, consultancy company).

> *"In our ecosystem, there are new figures, many digital stakeholders, our customers are so prepared and informed that my team needs to pay much more attention to always be on the ball and to manage the entire value chain. We have searched for new tools in order to organize all the interactions"* (Marketing Director, automotive company).

Because of the previously mentioned complications, B2B managers have understood even more how digital technologies can facilitate firms in managing the increasing number of interactions and requests from their stakeholders; in particular, CRM that represents a valuable tool to obtain coordination objectives (Kang *et al.*, 2020).

As proof of this, by coding the interviews, it was discovered that to coordinate different actors in their network and to systematize relations firms are using CRM systems much more often than before.

> *"I introduced the CRM before the COVID-19 pandemic and I could see the benefits even before this emergency but now this tool has become vital for my company. We manage to attend to many more relationships and interactions and the software is able to prioritize the leads that are ready to close the deals"* (Marketing Director, manufacturing company).

> *"I have been forced to adopt a CRM system in my operational system during the pandemic emergency, because my marketing and sales department were no longer able to coordinate their work, exchange data and trace the customer's activities. The experience in the office was different before the pandemic; we all worked together and we usually exchanged opinions and information but with the forced distancing policies, it has been more difficult to manage those activities. For this reason, we have decided to implement a CRM to have better coordination"* (Marketing Director, food company).

This technology was a trend even in the pre-pandemic panorama but with the new situation created by COVID-19, in such cases, it has become mandatory to survive. The mixture of physical and online players, as well as new challenges brought on by the pandemic, has complicated the business landscape. These CRM systems help coordinate all interactions, they distinguish and prioritize the customers and manage to spread the most useful information among stakeholders.

4.2.2 Enabling Visualization

During the interviews it was understood how B2B players, during business interactions, want to have a clear idea of what the requests and the objectives of their interlocutors are. In this context, visualization is a necessary approach to communicating and illustrating the value of their offers and the potentialities in business relationships. In fact, a clear visualization of the other party's points helps firms to increase the level of coordination to be aligned in reaching the objectives desired.

> *"To be in line with my clients I need to understand what the objectives and their requests are. It's no longer sufficient to simply discuss them. You need to demonstrate your points. For this reason, the use of the visual element has become vital in every business meeting or brief, it helps to focus attention and to better explain your line"* (Key Account Manager, beverage company).

> *"When I have to meet new customers, my first priority is to give a clear visualization of my objectives, of my products and services, this is the basis in which to align. In this way we can build stronger relationships based on an interrelated exchange"* (Sales Director, food company).

In a new techno-mediated environment where complications from the COVID-19 pandemic has moved business relationships online, visualization as an element of coordination is achieved through the use of digital presentations.

> *"In digital meetings we have used the visual element more than in the physical context., Preparing presentations to convince our customers has become central to align and to reach our objectives. Identifying the other party's requirements is now mediated by the use of technological tools"* (Sales Director, large distribution company).

> *"With the emergency we have not been able to meet our customers in person, for this reason we have thought of new ways to communicate our points. We have implemented the use of visual presentations during meetings. We immediately noticed the benefits: more attention from our clients, more possibilities to close the deal and a perfect coordination between our interests and their requirements"* (Marketing Director, digital company).

> *"We usually conduct our negotiations with only our price lists and informative documentation of our products. With digital meetings, it is no longer possible, we have to prepare a good presentation in order to acquire new leads and to coordinate our points"* (Sales Director, large distribution company).

Visualization has become a fundamental element in today's digital B2B relationships and this has been exacerbated by the pandemic. Business professionals have a restricted amount of time in which to make their selling points and there is no direct contact to communicate their ideas. In all business interactions, B2B managers have to illustrate the pros and cons of their projects by giving a clear picture and visualization, with the use of digital presentations, has become vital to making their point immediately clear. This is even more true in the case of meetings that are rich in information or data as cognitive overload can occur, with the consequence that the audience has difficulty remembering

the main concepts. To avoid this, the use of visual tools becomes of primary importance (West *et al.*, 2020).

However, visualization has another use. It can also be considered a new way for business professionals to make decisions in real time, to coordinate with clients who need aligned interlocutors. The ability to coordinate the decision phase is related to the capacities of B2B players but it is highly facilitated by visualization through the use of technology that manages to increase the efficiency of this process. This approach is mediated by the use of real-time dashboards which can be considered visual and interactive tools designed to provide a rapid analysis of a company's performance. They represent a supportive tool in extracting analytical insights and facilitating communication inside by firms creating a continuous exchange of information across departments (De Jong, et *al.*, 2021).

Dashboards particularly support coordination and joint decision-making processes by providing information in real-time and the analytical insights to take the right actions that are aligned with the current situation of the company. It makes it possible to analyze the state of the firm and the requests of each department. This aspect has been further emphasized during the COVID-19 pandemic, when decision-making processes had to be managed remotely due to distancing policies and the use of digital technology, such as dashboards, has acquired primary importance and value.

> *"I have implemented a dashboard in my activity. It was complicated at the beginning, but now it has become fundamental in everyday operations. I can analyze all the needed information in real time and I can make decisions based on data and being coordinated with all my team and their requests"* (Marketing director, digital company).

> *"In this complex time, I needed a tool that could give me a complete vision of the state of the company since my business interlocutors needed real time responses. With this dashboard I could control any time, also during the business meetings, all the required information, giving me the possibility to make more appropriate decisions in line with the objectives of the firm"* (Sales Director, large distribution company).

These tools allow a clearer vision of the situation of the company, the resources, the needs, giving immediate insights to the users to make decisions, to undertake new deals and to create new economic relationships.

4.2.3 Agile Team Organization

Conducting the interviews, it was noticed that there was a problem of coordination of relationships, also internally, among the departments of the same firm. Business professionals stated that situations

where there are long chain teams with a large number of workers located in different areas, creates problems of communication and coordination. Departments with various figures cooperating in similar roles and where there are no clear apical figures to refer to, makes it complicated to align. This process has been exacerbated by the Covid-19 pandemic, the compliance with the distancing policies and other organizational complications and has required a new structure within the firms. In fact, companies have decided to simplify decisional and relational processes by eliminating slow-moving hierarchies and administrations (De Smet *et al.*, 2020).

> *"There were 8 marketing directors in the same country area, our colleagues didn't know who to refer to or to ask for authorization. Our duties were too fragmented, we all had to agree to make even the easiest decisions and this delayed all business activities"* (Marketing Director, digital company).

> *"The sales process that was too fragmented caused the presence of too many sales professionals and accountants for the same retail format. There was not a clear distinction of functions. With the pandemic situation there was much more confusion, for this reason, the company has redefined the entire structure of the Sales Team"* (Sales Director, travel company).

It is evident that the creation of "long channel teams" with too many professionals creates problems of coordination and communication. For this reason, it seems that B2B firms prefer smaller teams with a distinction between apical figures and with a clear differentiation of functions.
The overcrowded departments, even if allowing for more professionals and more specializations, create significant coordination problems. Furthermore, the choice for a short management structure does not represent the "size" of the firm. In fact, most of the larger companies studied present very small and agile departments with a limited number of professionals. In this way, they can cooperate and make quicker decisions.

> *"There are only 4 sales accountants for the Italian territory, although our company is one of the biggest in its industry and its revenue revolves around 600 million Euros per year. I think that this agile structure is perfectly tailored to us. We are coordinated and we manage to close deals faster"* (Sales Manager, food company).

> *"The sales team of the entire company is made up of a few figures and 2 key accounts, both have their own team, but with a limited number of professionals. We think that small teams*

work more proficiently even though we have more tasks to complete. Our company is one of the biggest in its sector but when we worked with a large number of people in the sales department, we were not able to coordinate efficiently" (Sales Director, food company).

Agile organizations are also facilitated by the use of digital tools that allow direct interactions as well as the management of business processes in a coordinated manner (Pagani and Pardo, 2017). This is also demonstrated by the fact that, as analyzed in several interviews, companies are implementing digital collaborative platforms such as CRMs and AI software's capable of facilitating working relationships and interconnections between employees. The purpose is to create channels to manage information and to communicate with other colleagues without incurring logistical difficulties.

The process of an internal reorganization of teams through the use of technology has also been accelerated by the pandemic, which mandates speed and coordination to gain powerful outcomes and to increase the performance of the firms (De Smet *et al.*, 2020). The COVID-19 pandemic has made it necessary to rethink the organizational structure of firms, especially in sales departments, with the aim of establishing more coordination between workers. This emergency has led to significant problems in aligning large teams considering the distancing policies and the complications brought on by the emergency. For this reason, as seen in different interviews, it is becoming a priority for B2B firms to adopt new structures and new digital approaches for coordination.

Table 6 Coordination: Selected Evidence

Second-order themes	**Selected evidence on first-order codes**
CRM based coordination	*A complex B2B ecosystem made by new players*
	COVID-19 has increased the number of actors and the number of interactions that we have to face, and it is not easy to give attention to all these players. (#35)
	With the emergency, with the boosting of digitalization, the B2B context has been overwhelmed by new online players, new digital communities have born, and we were very in trouble in the initial phase of the emergency since we did not know how to face all these interactions. (#19)
	Systematization of interactions through technology
	Our firm needed a tool to coordinate all the interactions and to deal with my customers and all the stakeholders. For this reason, we introduced a CRM in our organization. (#26)
	COVID-19 has complicated the alignment, internally with my team, and externally with customers, for this reason we adopted a CRM to manage and face these complications. (#17)

Enabling Visualization	*Digital presentation to identify the requests and the objectives of other players*
	With the online meetings we have less time to show our ideas, for this reason we increased the use of presentations to allow a perfect identification of our points. (#30)
	New digital meetings are very concise, these go straight to the point, the use of presentation is fundamental to identify the main ideas and to states the objectives. (#16)
	Decision process through Real-time Dashboards
	During the decision process we needed a tool to visualize all the primary data in order to take decisions coordinated with all the team, for this reason we adopted Real-Time dashboards. (#24)
	To take the right choices we need to be aligned with the entire firm and with their requests, for this reason we introduced Real-time dashboards that allow to easily visualize all the information. (#29)
Agile team organization	*Crowded company departments with no clear apical figures*
	We were too many professionals in the sales department, our work was very fragmented and we did not manage to be coordinated. (#38)
	There were a lot of figures with the same role, there was not an alignment in our operational processes. (#14)
	There were three heads of marketing department and we did not know who to interface with, there was not a clear organization in the firm. (#41)
	Reorganization of company departments
	With the Pandemic, we have decided to organize differently our firm's departments, and we have decided to readapt some figures in other roles to create more agile teams. (#13)
	We rethought internal departments to create smaller teams that are able to work more coordinated. (#18)

4.3 Digital Trust

Digital trust is a third dimension that affects digital B2B relationships. It is probably one of the most penetrating forces in modern markets. It is a general concept, but it was interesting to understand how this dimension grows in a technology-mediated environment. It specifically refers to trust between digital partners and it can also be influenced by the perception of the tools used. For instance, the opportunity to use technology that simulates real in-person contact reinforces trust, while only chatting has the opposite effect. According to this vision, technology represents an enabler of the relationship that can influence the formation of trust in a techno-mediated environment.

Furthermore, it is even more difficult to build trust in a digital context where physical interactions are greatly reduced and all contact is mediated by technology.

The COVID-19 situation has outlined the importance of this driver; the pandemic emergency that we are currently experiencing has created new economic possibilities, but at the same time many difficulties, particularly for B2B firms. It was noticed during the interviews, in fact, that managers

and B2B professionals prefer to establish business relationships with trustworthy counterparts that demonstrate transparency.
By coding the empirical data, two sub-dimensions have been extracted within this dimension and they are: Transparency and Relational Contract (See table 7).

4.3.1 Transparency

The first sub-dimension is transparency which is a wide concept with many facets. It mainly regards the exchange of information between different players. This is outlined in the literature that defines information transparency as the degree of visibility and accessibility of information (Kumar, 2020; Zhu, 2002). What emerged from the interviews is the necessity to generate a more "crystal-like" approach in business interactions where all conditions are made explicit and there is no room for subjective interpretation of clauses and requests.
In most cases within the B2B context, the exploitation of information is not seen positively as data provides its owner with a position of power and the disclosure of this information could increase the efforts of competitors.

> *"In my industry sector, it is very difficult to negotiate an exchange of information. We are only given the number of final products sold but nothing more. It is very problematic, we could have increased benefits by receiving more detailed data, we could change our strategies, our route to market, and our target"* (Sales Director, food company).

> *"It is so bad when I have to buy data from companies like Nielsen because my interlocutors refuse to give me access to them. For this reason, I look for new collaborations where I can build more trustworthy collaboration"* (Sales Director, beverage company).

However, we noticed how this lack of information is harmful in the creation of new relationships, especially in a digital environment where there is no physical or direct contact among the players.

> *"I always seek out customers that accept disclosing information to me, when I need to start a campaign for a new product, I need that data. However, in a large distribution company it is very difficult to find such trustworthy interlocutors. This situation has changed slightly with the Pandemic. The emergency is forcing us to exchange data since we have limited access to formats and our professionals cannot collect information in stores and E-commerce*

is becoming fundamental. We have discovered that collaboration is necessary to survive" (Sales Director, large distribution company).

"In the large distribution sector, we do not usually exchange data, we do not want to empower our competitors, even though I clearly know that this behavior is harmful for all of us. With digitalization something is changing, with the use of CRM or blockchains we try to create a flow of data useful for everyone" (Sales Director, large distribution company).

It seems paradoxical, that even if there is this difficulty in exploiting information, nearly all B2B professionals stated that when they begin a new digital collaboration, one of the main points that they try to negotiate is the visibility and accessibility of data. They look for firms that maintain a sufficient level of transparency for the entire duration of the relationship. For this reason, a big shift in business behavior is necessary. From a practical perspective, it is possible to state a need in the B2B context to create relationships based on the equal exchange of information and on a new "crystal" approach in carrying out business.

Various managers from the interviews conducted, affirmed how important it is to avoid all forms of vagueness and uncertainty in B2B relationships, especially in a digital context where business is conducted quickly. For this reason, it was noticed, especially during the Covid-19 pandemic, the spread of B2B e-commerce used by managers as it guarantees clarity and the correct description of the goods or services offered. There is no room for error as everything is explained during order placement or directly during purchase. The use of e-commerce in B2B is leading to various positive aspects. First of all, buyers can get information more rapidly, receive orders, have support and develop new services in a quicker and more affordable way. It has also changed the nature of this tool from a platform where small amounts of money were spent with low-value purchases to a platform where buying more expensive products. The managers interviewed stated that customers are spending more money than before on these platforms as they have understood that e-commerce provides clear information and secure transactions. Fewer mistakes are also made using the platform compared to face-to-face interactions as often these led to misunderstandings or a lack of information being provided.

"We have introduced our e-commerce because of the closing of all the commercial activities due to COVID-19, it has been an incredible opportunity and it provides all the necessary, detailed information to our customers. It is an amazing tool to carry out business transactions" (Sales Director, fashion company).

"Before the pandemic situation we have never used e-commerce solutions to place orders, we would have asked for a meeting in person. Now, we have been, in a certain sense, forced to use it, but we have discovered incredible functionalities and positive conditions as the clear traceability of all the items ordered. Differently from the past, we have more detailed information" (Sales Director, beverage company).

"We do not have our own e-commerce business, but during the pandemic we have started to collaborate with Amazon, this is a new experience for us. They represent the future; they are truly interested in their customers as well as the products. With them, we have begun a completely new kind of relationship, with a more transparent essence; we continually receive and send data" (Sales Director, fashion company).

"Now we use e-commerce to order materials, spending up to 500,000 euros. Before COVID-19, it was unthinkable, we would never have done a similar purchase using this tool. We have understood that this is a precious and clear tool for our business" (Sales Manager, iron production company).

4.3.2 Relational Contract

During the interviews it was noticed how B2B professionals continued to state that to build trust and long-term business relationships, they look for more agile tools to negotiate and to conclude the deals. They stated that, especially after the COVID-19 emergency, they are using more Relational Contracts to close deals. These are new forms of agreements based on trust between the parties.

Relational Contracts represent a different way of interpreting standard forms of transactions as they are based on a new sense of relationship (Kwiatek *et al.*, 2020). They are conceived in a way to include the complexity and variability of the context in which actors operate, as COVID-19 has shown, so that clauses and conditions can be revised during the relationship while maintaining basic principles of transparency and fairness.

They are negotiated with the aim of creating value, not just focusing only on the deal. They seek to create a partnership that is more than a "one shot" interaction as they are based on social norms that influence all the processes and they "live" in a more flexible ecosystem where clauses and conditions can be revised during the course of the relationship.

With the COVID-19 pandemic, professionals require more agile tools as they always need to react to sudden changes such as government mandated decisions, forced lockdowns, interruption of the supply chain or total closure of business activities. For this reason, rigid negotiations or penal clauses

in a contract become useless in this unstable situation. Managers need flexible instruments to start new business relationships and to be sure to negotiate with a trustworthy interlocutor.

> *"With the pandemic situation it was difficult for me to respect the terms of my orders, fortunately, my customers understood the situation and were very flexible. During the pandemic, I decided to negotiate contracts with a relational essence, this gave my clients and me the possibility to be more relaxed and to face the problems that derived from the pandemic"* (Sales Director, food company).

> *"Negotiating a rigid contract as in the past, has become unthinkable, we have asked for the assistance of legal professionals in order to help us to find "lithe" tools to start business interactions, with clear clauses that would protect us in case of a breach of contract"* (Sales Director, large distribution company).

With the persistence of the pandemic situation, B2B professionals have understood how a clear and fair negotiation is more profitable in acquiring new clients and in building more trustworthy relationships. Furthermore, they noticed how technology can facilitate this process, as the case of Smart Contracts that through the support of a blockchain system, based on the creation of linked block of contracts, allow more secure, customizable and trustworthy relationships. As stated in many interviews, blockchain is one of the most proficient tools in guaranteeing transparency and enabling secure and equal exchange of information between all stakeholders. It is used to analyze, control and share data and it has been designed with the interests of interorganizational relationships.
Smart Contracts can be considered like software programs that connect, in a cause-effect relationship, some conditions with the occurrence of some binding events decided by the parties without any human intervention (Chen *et al.*, 2020). They are based on algorithm logic and this increases the precision of these agreements, as also stated in many of the interviews. Moreover, these agreements are highly customizable and facilitate the creation of a more relational approach with customers.

> *"I have started to use Smart Contracts to stipulate securities or insurance. They allow us to systematize many processes and to customize many services. They facilitate the negotiation phase with my customers. We only have to insert our conditions and the rest is carried out by the machine. I really think that these agreements increase the level of trust with our customers since there is no room for errors or misunderstandings"* (Sales Director, Insurance Company).

"We were looking for a digital tool to speed up the negotiation phase while maintaining a high level of relationship with our customers. For this reason, I have implemented Smart Contracts and a blockchain in my operating system. This allows us to increase the level of trust with customers, to provide more detailed information and any kind of data they may need. This has allowed us a relational approach to our business in a digital environment. We have also started to make transactions with our customers using this tool. It is very effective and much appreciated by all. Unfortunately, until now, few companies have decided to use this kind of technology" (Sales director, financial company).

"Our transactions are carried out through Smart Contracts and a blockchain system. This permits to provide a more tailored service as well as a more secure instrument for our customers. Furthermore, this allows us to increase the trust behind us, everything is clear and more professional" (Marketing director, financial company).

As clearly stated in the interviews, B2B professionals think this new techno-mediated interaction based on the use of Smart Contracts represents the future of negotiation. Moreover, these tools grant a high level of flexibility, allowing customization and personalization of the conditions. However, until now, it has not been the general business practice to apply these tools in all industry sectors and not all companies are ready to take on this challenge in the immediate future.

Table 7 Digital Trust: Selected Evidence

Second-order themes	**Selected evidence on first-order codes**
Transparency	*Exchange of information between B2B actors*
	We always search for partners that allow the exchange of information. This isfundamental to build business relations. (#25)
	In our market, it is difficult to have partners that will exploit data and information, but we think this is the base to build a trusty relation. (#25)
	We are available to give information and we try to avoid every vagueness in undertaking business, and this is what we expect from partners. (#21)
	Diffusion of E-commerce and Block Chain in the B2B context
	To avoid every form of vagueness with our customers we implemented an E-commerce, in which all the products and the services are explained perfectly. (#3)
	E-commerce helps us in increasing the level of trust of our customers since all our products are clearly defined and there is not space for mistake. (#18)
	We implemented Block Chain to trace the origins of all our products. We noticed how our customers have been delighted with this, and now they consider us as one of the trustiest companies in the market scenario. (#31)

Relational Contract	*A relational approach in the negotiation phase*
	With the arrival of the pandemic has become more difficult to negotiate a deal, since conditions change continually due to external factors, for this reason we adopted a relational approach in closing the contracts. (#36)
	Our customers did not manage to respect all the condition of the contracts due to COVID-19, but we have decided to be very understanding, contracting with them more flexible clauses. This increased the level of trust of our customers in us. (#25)
	We understood how penal clauses and rigid negotiation could be disabling in closing deals, for this reason we adopted a relational approach, with more flexible conditions. (#21)
	Smart Contract
	We have introduced Smart Contracts to facilitate and customize the negotiation phase and the clauses for every customer. They allow a crystal negotiation with a tailored approach. (#19)
	We noticed how the use of Smart Contracts increased the level of trust of our customers since all the negotiation phase and the execution of the deal is carried on by the machine, for this reason there is not space for mistake. (#36)

5. Discussion

COVID-19 has shed light on the fact that digitalization is not an isolated phenomenon, but has led to the need to manage relationships in a different way. The damage of the pandemic has indeed brought forth the issue of how business activities and relationship building processes should be re-organized, as well as how human and technology assets can be better integrated and coordinated (Sheth, 2020). For most B2B companies there is no alternative, it is a matter of survival and of adaptation in a pandemic reality (McKinsey Report, 2020).

In recent years, literature exploring the digital approach in B2B has become substantive with scholars focusing on social media (Agnihotri *et al*., 2016), e-commerce (Pavlou and El Sawy, 2002; Chang *et al.,* 2020; Koponen and Rytsy, 2020), and virtual marketplaces (Ordanini and Pol, 2001), as well as CRM (Corsaro and Anzivino, 2021), among others. However, how companies manage relationships in a new digital setting created by the COVID-19 pandemic, remains under investigated. This study has shown that a relational approach can no longer be considered separate from a digital setting and the challenge is how to maintain this relational link when technology is involved.

From the data obtained, it was noticed that the digital transformation that COVID-19 has affected three main dimensions of a relationship approach in B2B. The first dimension is the *efficiency of interaction*. The use of technology and the digital mediated approach has enabled the proliferation of more efficient sales systems supporting interactions with customers and other stakeholders.

During the Pandemic, B2B professionals, after an initial stage of complexities in handling digital-mediated relationships, understood how this technology could increase the quality of the interactions,

the effectiveness of their operations and the resource integration processes between different player of the ecosystem (Skylar et al, 2019); B2B managers have changed the perception of digital transformation considering it as an opportunity to be exploited.

Companies are adopting new solutions to manage resources and technology is playing a crucial role. It was found in this research, more than described in previous studies, that automation systems and CRM have decreased the capital used in repetitive tasks. For instance, e-commerce has cut logistics costs and simplified many activities. Video conferences and social media have introduced new forms of digital communication and have allowed companies to eradicate travel costs and the need for long negotiations. Furthermore, AI and IOT have guaranteed advanced tools to process data and information without the intervention of human workers. This idea is no longer only part of a B2C tradition. In fact, with the COVID-19 pandemic, B2B players through the use of digital tools need to personalize and tailor their products and services to attract more customers at a level never seen before (Hartmann *et al*., 2020).

One more element that managers have mentioned is crucial to generating efficiency is the need to accelerate the marketing and sales funnel. As stated in recent literature (Corsaro, 2018), B2B players need to establish a sense of urgency in the other party and to understand when it is necessary to "lose fast". It is evident that time-related considerations have become even more strategic after COVID-19, notwithstanding the past where temporal elements were often ignored or assumed constant when approaching sales research matters (Kunisch *et al*., 2017), while it has become even more key with the onset of the pandemic. The COVID-19 landscape has defined a new concept of time which has completely reorganized marketing and sales processes by boosting the relational processes at a level never seen before. Time has a new essence (Corsaro and Anzivino, 2021), and digital tools may facilitate human actions by providing the tools to face this challenge.

The second dimension that has been affected by the pandemic is *coordination*. This dimension regards the coordination between all the interaction that B2B players face in the activity and it has an internal and external essence. The internal coordination looks at the need for firms to define a unique organization with teams that can communicate and work together in a more effective way (Kotler and Armstrong, 2017). This aspect now plays an even more central role considering that the pandemic has redefined the in-office experience with the forced distancing policies and new restrictions. For this reason, B2B players are seeking new internal organization figures to simplify firm relational processes (as marketing and sales processes). During the interviews, B2B managers affirmed how the complications caused by the emergency outlined the necessity to create small and agile departments to allow for more fluid interaction and avoid any form of misunderstanding. It was noticed how some companies presented overwhelmed working groups without clear apical figures and this created

confusion and difficulty in making proper decisions. According to Hartmann *et al.,* (2020), the pandemic has caused gaps and disadvantages that require aligned decision processes. In fact, as clearly stated in the literature, the current global emergency has outlined the need to make decisions that derive from better coordination inside all departments of a firm to handle the customer with a unique approach and not through uncoordinated touch points. This is in line with the idea that new marketing, sales and service funnel organizational and coordination processes need to be defined (Enyinda *et al.,* 2021), taking into account all of the complications and difficulties caused by the pandemic.

Externally, instead, coordination refers to the ecosystem of external players that make up the B2B market (Agnihotri *et al*., 2016; Marshall *et al*., 2012). In a business landscape in which networking is a central point (Quinton and Wilson, 2016), the ability to create relationships represents a must.

During the Covid-19 emergency, the number of players of the b2b ecosystem has increased considerably involving difficulties in the management of relationships and in handling business operations; companies, considering also these complications, are no longer able to carefully coordinate all interactions with their customers and stakeholders.

For this reason, they have decided to introduce a CRM to facilitate coordination (Chatterjee *et al.,* 2021; Saura *et al.,* 2021; Rindfleisch *et al*., 2017). An aspect of coordination that emerged from this study which has still not been fully studied, refers to the use of visuals that allow for a clearer understanding of each party's perspective and whose role is leveraged in a digital setting as well as when multiple actors participate in conversations (Singh et al., 2020). From the findings there is a connection between visualization and coordination in making decisions, as outlined through the use of real-time dashboards. These tools can show all the company data and information necessary to make a decision that is in line with the needs and the current company situation. This aspect has been outlined in the interviews, considering that B2B managers during the pandemic have been greatly facilitated in taking important decisions or redefining internal or external processes through the use of dashboards, not having the possibility to have a constant and direct approach with all the member of their teams.

The third dimension that has been affected by COVID-19 is Digital Trust. Customers and stakeholders are no longer focused on the product or service itself, but more on the trusting and transparent relationship that they can build with the firm. Trust is becoming a primary point in this new digital mediated relationship, leading to specifically reference the label 'Digital Trust' to stress the fact that some proxies and clues of trust have changed when most relationships occur in a digital setting. This study outlines how this dimension is influenced by many factors. First of all, transparency that pertains to the interrelated and equal exchange of information between players is

even more important. “Information transparency” has been identified in literature (Kumar *et al*., 2020), as being an equal flow of data during a business relationship. In the B2B context, the fear of exploiting data by the counterpart and the continuous search for players that provide all kinds of information coexists paradoxically. B2B players need and spasmodically search for data, but at the same time, they claim that they are not willing to provide or share all information. This significantly affects the possibility of building long term and trusting relationships with other players. Furthermore, in order to create a transparent relationship, every form of ambiguity has to be avoided in a B2B context. This is a consequence of the pandemic emergency and with the incredible acceleration of relationships the room for error is less acceptable and all conditions of a deal need to be clearly defined. It is a sort of general rule of conduct that B2B players should respect in order to build a trustworthy relationship with their customers. For this reason, paradoxically, the use of e-commerce has increased significantly in the current B2B scenario (Salesforce, 2020). In fact, it was noticed during the interviews, as also clearly stated in the literature (Chang *et al*., 2020), how e-commerce facilitates a clear and trustworthy approach in handling business deals as it specifically describes all the details and it allows for a high level of customization of products and services offered through a defined learning process.

A particular interesting element that emerged from this study is that the people interviewed are becoming more and more familiar with blockchain, to increase transparency in a digital environment (Rejeb *et al.*, 2019). Blockchain guarantees an equal position between all the parts by granting clarity during interactions. All of the processes and information are traced using Artificial Intelligence and all sides have easy access to this information. However, the use of this tool is, until now, limited to only some industries and sectors of the market. It is mainly implemented by larger companies rather than small or medium-sized companies that do not have digital and cultural infrastructures to properly use it (Chang *et al*., 2019).

The last point that this study underlines is that to build a trustworthy business interaction, companies are experiencing new forms of negotiations based on a relational approach. The COVID-19 pandemic has created a very unstable landscape in which external factors such as political decisions or government restrictions quickly change the scenario (Cankurtarana and Beverland, 2020). For this reason, managers look for agile agreements to face these unexpected changes that could compromise business agreements. They say that it is not the moment to negotiate based on rigid clauses but rather a relational negotiation seems the better solution. This leads to tools that offer the possibility of facing these sudden changes without incurring harsh consequences in case of delay or difficulty in carrying out the agreed services. Managers are also trying to digitize this negotiation approach through the use of Smart Contracts that are very flexible and customizable. These instruments permit the regulation

of relationships in a logic of If/then cause consequences. They are codified through Artificial Intelligence systems that guarantee the correctness of the interaction and they can tailor the conditions for each party leading to an increased level of trust in the deal (Warrington and Caldwell, 2000).

It is then interesting to observe that the dimensions identified in the framework are all interrelated and thus managers can strongly increase or reduce the overall value generated in the management of business relationships. For instance, better coordinating the digital flow of communication and information has a positive impact on efficiency by accelerating the selling process and providing granular and contextualized data that allows companies to adapt and to quickly generate a better customer experience across all touchpoints and e-businesses. Coordination also allows people to free up resources they can then dedicate to increasing the digital trust in business relationships. Similarly, when digital trust improves actors may be keener in sharing data which, in turn, is another important condition in enabling coordination.

6. Conclusions

COVID-19 has redefined the way in which B2B companies create business relationships, giving a primary role to digitalization. This study contributes to the recent debate which states that the COVID-19 pandemic has led to rethinking the way companies create and maintain business relationships, particularly considering the increased use of digital tools (Rangarajanet *et al.,* 2021; Crick and Crick, 2020; Hartmann and Lussier, 2020). It sheds light on the drivers of such new relational approaches that have up to now remained ambiguous (Hadjikhani and Lindh, 2020).

In this paper, it is developed a conceptual framework to understand how B2B firms should rethink their internal and external processes to develop a new hybrid form of business interactions in the economic scenario affected by the COVID-19 pandemic. This study analyzes this new form of relationship by identifying the dimensions and subdimensions created within it and, therefore, trying to organize a very fragmented debate and support it with empirical evidence. It became evident that, while much literature is dedicated to discussing the potentialities and use of technologies in B2B (Drummond *et al.,* 2020; Bharadwaj and Shipley, 2020), the attention should instead be placed on the underlying relational processes which are supported by technologies. This is because they are the ones that allow for relational logic to be maintained even in a digital environment of interaction. The framework developed indicates the main drivers that increase the possibility to create and maintain business relationships in a digital mediated environment and to face the complications caused by the pandemic.

The study has some limitations. First, the study is exploratory. The categorization and the relative dimensions extracted analyze the state-of-the-art technology at the moment of the research but we are

still in the middle of the COVID-19 pandemic and it is not possible to have a complete vision of this phenomenon yet, it is clear that the B2B market will continue to evolve in the following months. For this reason, future studies would be useful in widening the discussion with new insights from different stages of this pandemic scenario. This would permit to have a complete understanding on the topic. Second, it has been analyzed the sales and marketing perspective while it would be relevant to compare it to the buyer's perspective and analyze gaps in how the transformation caused by COVID-19 has been endured. Third, having chosen a sample of Italian companies for the analysis could cause a lack of generalizability of the results, notwithstanding the Italian companies chosen for the analysis have a strong multinational vision of conducting business deals and building relationships abroad. Finally, given that the sample includes companies from different industries, future studies could explore if the industry has any effect on the framework proposed or if there are other contextual conditions which influence the relevance and structure of the dimensions identified.

7. Managerial implications

The research conducted has an important and practical significance considering that it has elaborated a categorization that redefines the relational digital B2B approach in the COVID-19 era. It is a practical tool for B2B firms to understand what dimensions should be exploited in the process of maintaining and establishing business interactions with other players and to obtain advantages considering the complications of the pandemic.

With the advent of COVID-19, the entire business perspective has greatly changed leading to the acceleration of business processes as in the case of digital transformation that for many B2B companies have dramatically increased. There is an urgency for profound cooperation between human and digital values.

Digital is heavily stressed in this study. Technology can offer possible solutions in this difficult situation. It can guarantee new markets, as offered by e-commerce or virtual marketplaces. It can also provide new forms of communication with stakeholders like those provided by social media or new forms of digital negotiations as in the case of Smart Contracts and blockchain. Through this study, it is demonstrated that digitalization is not only about the digitizing of resources (Leinwand and Mani, 2021), but that there is a more complex context to be considered in building a relationship focused view in light of transformation. For this reason, the role of CRM is becoming more crucial for coordination as it provides the flexibility needed in the management of business relationships, both with customers and other players in the company ecosystem. Furthermore, CRM generates benefits in terms of effectiveness as it allows businesses to simplify processes by automating repetitive tasks

and interacting with more clients to optimize the quality and the level of relationships that human professionals intend to foster.

However, technology is only a tool and becomes useless without human interaction or the capacity and culture to properly use it. For this reason, B2B companies need to invest in human capital in the marketing and sales forces. Sales professionals have become more fundamental and complex figures that need to develop particular skills linked more to so-called "hard skills" such as knowledge in the marketing field, accounting, and data analysis. At the same time, they need to increase their ability to create and solidify trusting relationships with their customers. In fact, in this very complicated social perspective, in which the pandemic is making in-person socialization more complicated, customers and interlocutors need players with soft skills that are empathetic and available to support them in every situation with a high level of problem-solving skill. It is also demonstrated that the playing field for salespeople has widened after the COVID-19 boost to digitalization. It now includes contractual aspects which cannot be fully delegated to lawyers as they include more relational aspects that are only known by those managing the business relationships.

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PAPER 2

Digital servitization in the fashion industry: opportunity and drivers for SMEs with particular focus to covid-19 period

Abstract

Academic literature has deeply defined the processes of servitization and digital transformation, but fewer studies have explored the topic of digital servitization. This paper aims to analyze how SMEs are approaching the process of digital servitization, considering the relevant changes and complications due to the COVID-19 pandemic. The methodology used includes a qualitative study based on the application of a grounded theory and theories-in-use approaches. 20 semi-structured interviews have been carried out with CEOs and sales and marketing professionals from the fashion industry. This research defines a conceptual model that describes what are the main drivers for SMEs operating in fashion to adopt digital servitization solutions in a business context affected by the Pandemic. The model comprises three dimensions: (1) Digital Value Proposition, (2) Smart Organization, (3) Digital Ambidexterity and 6 sub-dimensions. This paper also contributes to managerial practice, defining some directions to be fulfilled by SMEs of the fashion sector in order to create compelling digital servitization strategies.

Keywords: digitalization, digital servitization, fashion, SMEs, COVID-19 Pandemic.

1. Introduction

In an economic landscape that is becoming drastically more competitive (Chan et al., 2019), Small and Medium Enterprises (SMEs) are embracing digitalization to compete and succeed in this dynamic context.

From a theoretical perspective, digitalization refers to the adoption of digital technologies across a firm's organization and processes (Björkdahl, 2020). It should not be confused with digitization, which is how information and data are transferred from an analog form to a digital one (Tilson et al., 2010; Verhoef et al., 2019). However, more than digitization, digitalization is becoming the focus of several business activities (Björkdahl, 2020). In fact, over the past years, and more recently with the arrival of the COVID-19 emergency, companies have understood how technologies like IoT Systems,

Platforms, Cloud Computing, CRM, Artificial Intelligence Software, and other tools facilitate production and logistics processes (Isaksson et al., 2017). In general, digitalization improves value creation and organizational structures (Matt et. al, 2015) and allows asset reconfiguration and product development.

Fashion is one of the industries that are fully experiencing the digital transformation shift. For years, the companies in this sector have undergone internal transformative processes that have been further accelerated by the COVID-19 emergency, which has emphasized the need to adopt digital-mediated approaches and diversify the offer. About this last point, different studies have underlined how the fashion context is moving toward the logic of the service solutions (Ricchiardi et al., 2019).

The emergency has boosted a shift of the fashion industry toward the virtual dimension to enhance innovation in the whole value chain (Brydges et al., 2020). Digitalization is profoundly influencing the de-materialization of offerings and the diffusion of the value logic in use in the fashion sector. This phenomenon is redefining the industry's competitive logic and presents critical challenges for fashion to keep their model relevant.

The recent boost in the exploitation of digital technologies facilitates new business model to emerge, improving servitization through digitalization, thereby giving life to the concept of digital servitization (Bustinza et al., 2018; Cenamor et al., 2017; Coreynen et al., 2017). Digital servitization refers to the stream of literature that researches how digital technologies influence servitization. It consists of manufacturing firms' provision of digital services embedded in physical products (Paschou et al., 2020; Schroeder & Kotlarsky, 2015).

Although digital servitization is starting to be analyzed by recent literature (Paschou et al., 2021), little attention on the fashion industry has yet been conducted. Most of the studies have discussed the benefits in the context of large manufacturing firms (Martín-Peña et al., 2020; Naik et al., 2020), but this approach can also create opportunities for small and medium-sized enterprises (SMEs) by creating increased value for customers, scaling their technological capabilities, and expanding their reach into global markets (Reim et al., 2019). Despite its widespread use in many industries, digital servitization is still a topic of extensive debate because its implementation is far from simple, and companies tend to struggle with it (Kohtam¨aki et al., 2019; Lerch & Gotsch, 2015; Schroeder & Kotlarsky, 2015; Tronvoll et al., 2020; Vendrell-Herrero et al., 2017). Furthermore, most of the existent studies do not consider the transformative changes that occurred during the COVID-19 period to SMEs, which have further boosted the digital servitization process.

The fashion sector shows a strong dichotomy between large companies and SMEs (McKinsey, 2020). In particular, for years already big corporations have adopted digital value-in-use offers to their customers, while smaller firms have been pushed in recent times to modify their operational structure

to include technology and to approach servitization. In this context, SMEs continue to struggle in their attempt to realize digital service strategies (Kohtamaki et al., 2020; Zhang & Banerji, 2017).
Given the theoretical relevance and managerial importance of this issue, the purpose of this research is to examine how SMEs operating in fashion are embracing digital transformation and how they are moving towards digital servitization, within a business context that has been profoundly affected by COVID-19; the objective is to understand what are the main factors of this process. Made these premises the main research questions are: What are the drivers of digital servitization for fashion SMEs? How are these companies embracing digital servitization?
This study applies a qualitative methodology to develop a conceptual model that presents the main dimensions (and sub-dimensions) of the digital servitization processes for SMEs, considering the pandemic situation. This research also contributes to managerial practice; the previously mentioned drivers represent the main motivations to propose digital servitization offerings in the new fashion ecosystem affected by emergency. This study helps professionals to transform their business model more straightforwardly. The article is structured as follows. First, it presents a literature review concerning digitalization in the fashion context and the role of digital servitization in fashion business activities. Then, it follows an explanation of the methodology used and the findings with a description of the model conceptualized. In the end, the conclusions with future lines for research.

2. Theoretical framework

2.1 Digitalization and SMEs in the fashion industry

The extant studies have widely explored the implementation of digital technologies in large corporations (Cenamor et al., 2019) or innovative organizations like startups (Ghezzi & Cavallo, 2020); however, specific studies focusing on SMEs operating in the fashion context are still relatively scarce (Gonda et al., 2020). For this reason, significant investigations in this area seem necessary.
Manufacturing firms, particularly SMEs in fashion, are undergoing drastic innovations due to phenomena like globalization, global competition, and digital transformation (Bettiol et al., 2022).
Digital transformation for SMEs is often reflected by a disruption of the actual business models and the adoption of structural changes to the whole organization and operations (Lockl et al., 2018). Verhoef et al., (2019) provides a more complex idea of this phenomenon, stating that "digital transformation is multidisciplinary by nature, as it involves changes in strategy, organization, information technology, supply chains, and marketing" (p. 889-901).
Technology affects the essence of business models (Amit et al., 2012), and firms, without keeping up with these changes, risk becoming obsolete and uncompetitive (Bock et. al, 2012). Consequently,

companies are becoming more and more “digital oriented” (Quinton et al., 2018) and are adopting digital approaches in all functional areas with different mindsets (Verhoef et al., 2019); this leads to the acquisition of new skills, competencies, and knowledge that can contribute to this endemic transformation (Nambisan et al., 2020).

It is clear that this process offers different opportunities but simultaneously poses challenges for all those business activities that struggle to address this process of innovation (Arnold et. al, 2016). It should be noted that technology needs substantial and strategic investments with specific strategies in place. Financial barriers are common, and they primarily derive from cultural biases since SMEs do not perceive the value that technology can bring and remain focused only on the risk of losing their investments. SMEs generally tend to acquire digital tools only when a problem arises, without clear planning or program. Based on a short-term vision, this approach can be seen as an opportunistic response to scale digitalization, and in most cases, it also leads to mistakes in investment. SMEs usually adopt digital-mediated approaches to solve an immediate need without a profound transformation of the entire company. Furthermore, those firms are still influenced by the idea that fashion is only tied to craftsmanship, and adopting technology can compromise its essence.

In addition to economic obstacles, a lack of competencies and skills related to digitalization and a lack of business strategy may become missed opportunities for this transformation (Von Leipzig et al., 2017). Despite the initial complexities, there are many possibilities for companies to improve digitalization processes in their structure. First, applying technology to organizational processes increases the level of efficiency, saving financial and human resources costs. Platforms, visualization dashboards, or ICT systems can facilitate internal coordination among departments and external alignment with the entire ecosystem, enabling a continuous exchange of information and direct interactions.

Second, digitalization allows a more specific management and analysis of customer data, bringing improvements in the production phase and supply chain (Ardito et al., 2019). Furthermore, technology-oriented data generation can create new offerings and solutions, such as the case of product-service systems (PSSs), in which goods are developed in connection with the provision of related services to provide extra functionalities to clients and stakeholders (the case of servitization) (Frank et al., 2019). AI, through the capacities of machine learning and the deep learning algorithm, represents a valuable tool to gather and assess a large amount of information in real-time, providing precise results and predictive analysis.

Third, digitalization can lead SMEs to find connections and grow internationally. The technology eliminates the distances across foreign markets and industries (Grover et al., 2013; Lyytinen et al.,

2016). This produces innovation and new possibilities (Parida et al.,2012), but, at the same time, it requires structures to adapt products and services to external markets.

On the production side, digitalization is profoundly revolutionizing the fashion sector with new methods and tools developed to design and produce innovative items (Pasricha et al., 2018), as the case of 3D models, CAD, and printers. Furthermore, the significant flow of data and the use of learning programs improve the clothing's quality and customization (Noris et al., 2021).

Digital business models in the fashion industry are also leading to enhancing operational processes in the supply chain by adopting new strategies that tackle issues such as market instability (Zhou et al., 2010), agility, or production organization and control. Also, in this case, the use of data permits better design and mapping of the supply chain, building sustainable solutions, and decreasing the time to market.

Finally, the advancements in the use of technology also contribute to marketing and sales strategies. New forms of interactions with customers have been developed through online channels, and the creation of e-commerce and digital platforms (also social media) has generated hybrid sales solutions in which customers can have immersive buying experiences with the easy use of smartphones or computers. Connected to this is the idea that fashion firms, through technology, have the possibility to offer their consumers not only the item itself but a series of services and value-added solutions that enrich the customer experience. Digital servitization is growing drastically in the market, facilitating all those companies who manage to change their business models and adopt digitalization as a primary resource.

Successful digital servitization strategies depend on digitalization and include socio-technical structures that extend beyond technical processes and mainly refer to drastic changes in the company culture, in the entire value chain, and the ecosystems (Tronvoll et al., 2020; Lindman & Saarikko, 2019; Lusch & Nambisan, 2015). As explained in the next paragraph, the human-machine approach enables and constrains the core of digital servitization (Hinings et al., 2018).

2.2 Digital Servitization approaches in the fashion context

In the modern economy, customers are attracted by brands that offer services or PSS (Paschou et al., 2020). To meet this new trend, companies are changing their strategies to provide value-added solutions to their clients (Kuijken et al., 2017; Matthyssens et al., 2008). This process is known as servitization (Vandermerwe et al.,1988). The term servitization was first conceptualized by Vandermerwe and Rada (1988), who analyzed how firms were moving from offering products and services to creating integrated solutions with services in the lead role. It is a process that generates value by adding intangible services to tangible products (Mont, 2002; Tukker et al., 2006).

Servitization offers excellent possibilities for companies, but it has to be considered an important business decision with profound implications (Bustinza et al., 2018); it requires a preliminary and detailed analysis of the actual situation, of the pros and cons, considering that different resources and competences are required to start this shift, as well as different interactions with stakeholders, new digital infrastructures and high set up costs.

With the boosting of digitalization, servitization is leaning towards digital servitization, meaning that markets are embracing business models centered on technology and data (Kohtamäki et al., 2019; Sklyar et al., 2019). It has only been very recently that the synergies between servitization and digitalization are being explored (Storbacka, 2018) and, despite the increasing scientific attention, it is still in a very early stage of research (Paschou et al., 2017).

There are many interpretations of the process of digital servitization. Part of the academic literature (Skylar et al., 2019) considers technology as a tool for servitization scopes (Kindström et al., 2014), while other studies propose that technology is an essential part of the entire offering (Kohtamäki et al., 2019). Sjödin et al. (2020) identify industrial digital servitization as "the transformation in processes, capabilities, and offerings within industrial firms and their associate ecosystems to progressively create, deliver, and capture increased service value arising from a broad range of enabling digital technologies such as the Internet of Things (IoT), big data, artificial intelligence (AI), and cloud computing" (Sjödin et al., 2020b, p. 478). Paschou et al. (2020) comprehensively define digital servitization as "the development of new services and the improvement of existing ones through the use of digital technologies [. . .] to enable new (digital) business models, to find novel ways of (co)creating value, as well as to generate knowledge from data, improve the firm's" (Paschou et al. 2020, p. 284).

The shift to digital services is happening in many industries (Paschou et al., 2020; Ambroise et al., 2018), creating benefits but also posing numerous complexities. As larger companies, SMEs can be forced into approaching servitization by competitive pressures and product commoditization (Ardolino et al., 2018). Typically, firms adopt a digital servitization strategy to differentiate themselves from competitors (Opresnik & Taisch, 2015) and to find new revenue streams (Kohtamäki et al., 2019).

However, several types of barriers may hinder this type of innovation, which can be cognitive, managerial, operational, relational, or environmental. As specified before, this transformation is demanding, as it takes a complete reconfiguring of the business model of product-centric firms (Kohtamäki et al., 2019; Visnjic et al., 2019). The challenges concerning the adoption of digital servitization strategies may be different: the initial expenses to face, the use of complicated

technology, different capabilities to implement, different organizational structures, and new innovative co-creation approaches with customers.

First of all, this shift in business models requires the strict cooperation of technology that can lead to initial relevant costs; the use of platforms, visual dashboards, big data, AI, CRM, and IoT has become central to offering customized fashion services, and organizing effective supply chain processes, without the use of digital tools, it would not be possible to embrace these kinds of advanced strategies.

Another central point to consider is the complexity deriving from the exploitation of advanced digital systems, especially for SMEs. Technology is constantly evolving and becoming even more complex, and companies often struggle to face the demand for new tools and for those innovations that may extend beyond their existing capability base (Porter & Heppelman, 2014; Sjödin et al., 2020b). In general, servitization requires acquiring capabilities different from those explicitly related to tangible products (Raddats et al., 2022). Such competencies are even more challenging in digital servitization, which demands the teams to improve service-related competencies and those connected to technologies to boost service provision (Struyf et al., 2021). Those skills can be grouped into system integration, project management, IT systems, digital consulting, financial skills, and post-sales service (Huikkola et al., 2016), but also abilities in coordinating with suppliers and the ecosystem (Huikkola & Kohtamäki, 2017), and relational capabilities with stakeholders (Kohtamäki et al., 2013). Furthermore, introducing digital technologies to support digital services require also qualified contributions from external partners, software houses, and digital experts (Hasselblatt et al., 2018); in particular, small- and medium-sized enterprises (SMEs) frequently externalize these functions or need partners to face such complex innovations.

In addition, digital servitization modifies inter- and intra-firm processes as the ecosystem dynamics need agile approaches. In particular, many studies suggest that digital servitization requires a new way of working to improve agility and innovative co-creative practices with customers and the broader ecosystem (Ghezzi & Cavallo, 2020; Kohtamäki et al., 2019 Parida et al., 2019; Raddats et al., 2019). Companies need to position themselves at the same level as the customers for the co-production of the service itself.

In digital servitization, value is realized through co-creation, through collaborative activities by the parties involved, and through a deeper customer interaction (Grönroos, 2011). These processes see the customer as a co-creator of value and the provider as a value facilitator (Sjödin et al., 2016). This new logic produces a significant shift in roles and responsibilities for the players engaged in co-creation. In particular, embracing value co-creation in digital servitization would thus mean "understanding the customers' practices and how customers combine resources, processes, and

outcomes in interaction, where the service provider shifts from being a mere facilitator to a co-creator of value" (Grönros & Voima, 2013, p. 141).

Despite the challenges and complexities, digital servitization is growing across different industries, among them, the fashion sector is experimenting in this space. For SMEs, digital servitization provides new opportunities for long-term competitive advantage. It creates both opportunities and challenges (Paschou et al., 2020); for instance, the positive aspects are connected to the increasing value for customers, higher differentiation from competitors (Peillon & Dubruc, 2019; Coreynen et al., 2017), increased revenues and profits (Kowalkowski et al., 2017a, 2017b), consolidation of the cash flows, moderation of the impact of global crises in terms of sustainability approaches and expansion of their position into international markets transcending their liability of "localness" (Martín-Peña et al., 2020; Naik et al., 2020; Ziaee Bigdeli et al., 2018).

The idea of renting, redesigning, reusing, collecting, sorting, and recycling clothing apparel rather than just selling it is becoming very popular in the global market. In these models, functionality outweighs ownership, and the customer pays for the service offered, not the product purchased. These approaches emphasize alternative business approaches' potential in reducing the exploitation of natural resources and striving for improved product longevity as they extend the value of tangible products. Providing a service more than the product itself also contributes to sustainability as it is clear that the level of raw materials used and the quantity of production processes drastically decreases (Fortuna et al., 2017). Implementing efficient service-oriented and digitalized value propositions guarantees sustainability through a longer product lifecycle, resource and energy efficiency, multiple product usage, and reduced carbon emissions and material waste (Paiola et al., 2021).

This approach enables circularity, with the diffusion of the models of sharing economies and cooperative consumption impacting the linearity of the industry. This concerns the possibility of selling, donating, and exchanging practices of clothing and accessories through platforms between people not previously connected (Botsman & Rogers, 2010). Todeschini et al. (2017) recognize the digital servitization in fashion: "…allows the creation of a supporting ecosystem that drives resource and knowledge sharing, promotes the diffusion of sustainable practices, and ultimately allows business model experimentation" (Todeschini et al., 2017 p. 6). This approach implies the acceptance that garments are no longer sold but are swapped by groups of digitally connected customers and stakeholders.

In the long-term vision, this type of innovation drastically decreases the exploitation of raw materials and diminishes production processes (Fortuna & Diyamandoglu, 2017). This aspect is becoming central, considering that fashion in the last years has proven to be one of the most polluting industries

in today's market; great amounts of non-renewable resources are used, and the quantity of waste material is critical (Rathinamoorthy, 2019). New digital servitization offerings represent an effective solution to overcome these criticalities.

The topic of digital servitization is becoming of paramount importance, considering the advantages that this process can bring not only to large groups that have already approached this model but also to SMEs that are moving toward this form of business innovation. There is an urgency in academic research to deeply examine the topic of digital servitization for SMEs in the fashion context in light of the COVID-19 pandemic and also to give firms managerial tools to get over this complex period. This study aims to identify and explain the main dimensions of the digital servitization process, focusing on the dynamics that SMEs face daily in a scenario that continuously changes due to the effects of the emergency.

3. Methodology

A qualitative study applying grounded theory and theories-in-use approaches (TIU) (Gioia et al., 2013; Zeithaml et al., 2020) has been adopted to develop a conceptual model of the drivers of the digital servitization process for SMEs operating in the fashion industry. In this way, the underlying processes and interactions shaped by the views of multiple actors are analyzed (Creswell et al., 2018). The theories-in-use approach was deemed particularly appropriate as it allowed to take advantage of the experiences and knowledge of fashion industry professionals to identify relevant constructs that reflect the drivers associated with digital servitization (Zeithaml et al., 2020). The TIU approach stands out for its collaborative nature, leading to a process of co-development of theories. Participants actively participate to the theory development process, contributing in both implicit and explicit causal thinking about the ideas they find significant. In essence, it presupposes that individuals interviewed possess specific insights that researchers can uncover and extend by incorporating additional sources of understanding. The TIU proves particularly beneficial when scholars aim to: (1) formulate marketing theories, especially concerning novel and emerging phenomena; (2) expand existing perspectives and address uncertainties; or (3) provide guidance for future empirical endeavors (Zeithaml et al., 2020). It is most effective when analyzing broad and profound research questions or issues that miss satisfactory answers. In TIU research, the goal is not merely to report participants' statements but to analyze data across participants, identify common themes and ideas in their specific contributions, and distill these commonalities into wider constructs or variables that represent the foundational elements of an emerging theory.

The qualitative phase was carried out through semi-structured interviews between June 2020 and July 2022 (see Table 8).

Table 8 Data sources and applications

Data Source	Type of Data	Applications
Business Documents	**Business reports, business presentations (2020-2023)**	Understanding the principles of digital transformation of the fashion context with particular reference to SMEs.
Interviews	**First round (2020)** Interviews of 12 sales and marketing professionals, CEO, fashion designers, and communication directors (14 hours). Profiles detailedin Table 2, #1 to #12.	Gaining how the fashion firms approach digital servitization and how the COVID-19 has influenced it.
	Second round (2022) Interviews of 8 sales and marketing professionals, CEO (8 hours). Profiles detailedin Table 2, #13 to #20.	A deeper analysis of the digital servitization approach in a second phase of the COVID-19 emergency (post-pandemic), trying to redefine the main dimensions of this process and how it has evolved over the years.

3.1 Data collection

Data was collected through twenty in-depth semi-structured interviews with professionals operating in B2B SMEs in the fashion sector. Each interview lasted between 60 and 90 minutes, for a total of 23 hours. The audio recordings of the interviews were transcribed to allow for coding and analysis.
A purposeful and snowball sampling approach was applied to identify and select information-rich individuals with extensive knowledge relevant to the research questions and willing to share their experience to inform the research process (Zeithaml et al., 2020).
Participants were selected from companies and organizations involved in the implementation of the digital servitization process, chosen based on their presumed knowledge and experience regarding the phenomenon under study. This criterion ensures that the data provided by these individuals is both detailed and applicable beyond specific instances.
These "information-rich" individuals are chosen because they can provide substantial insights into the central issues of the research inquiry, thus aligning with the purpose of the study and facilitating a deeper understanding of the phenomenon under investigation.
Participants were recruited through LinkedIn and personal contacts and asked to provide referrals to other potential subjects. In this way, it was possible to identify common perceptions and experiences

while, at the same time, maximizing differences to obtain a multifaceted perspective and understand potential boundary conditions and theory nuances (Creswell et al., 2018).

Most participants held a marketing or sales position in fashion SMEs, and they were selected on the basis of their strategic view and the ability to provide critical insights on the implications for SMEs operating in the industry (Ivanova-Gongne et al., 2017). It is ensured variability in terms of gender and years of experience, and industry sub-sector represented. (Participant profiles are presented in Table 9.)

Table 9 Participant profiles

TABLE 1 - Participant profiles #	**Job Position**	**Gender**	**Seniority (in years)**	**Fashion industry sub-sector**
1	Sales Executive	Male	5	Clothing
2	CEO	Male	20	Clothing and Footwear
3	Communication Director	Female	9	Clothing
4	Commercial Director	Male	6	Footwear
5	CEO	Male	15	Clothing and Accessories
6	CEO	Male	28	Clothing
7	Fashion designer	Male	15	Clothing and Accessories
8	Marketing Director	Female	15	Clothing
9	Fashion Designer	Female	9	Clothing
10	Retail Buyer	Male	5	Clothing, Footwear and Accessories
11	Product Specialist	Male	30	Clothing and Accessories
12	Marketing Director	Female	15	Clothing
13	Communication Director	Male	9	Clothing, Footwear and Accessories
14	CEO	Female	15	Clothing and Accessories
15	Sales Executive	Male	8	Clothing and Accessories
16	Fashion designer	Female	12	Clothing
17	Marketing executive	Male	7	Footwear
18	Buyer	Female	15	Accessories
19	CEO	Male	24	Clothing, Footwear and Accessories
20	Sales Executive	Male	16	Footwear

The objectives of this phase were to identify the expectations and the barriers regarding digital transformation and the adoption of new technologies, as well as to understand the drivers that lead SMEs to approach digital servitization and the effects of the COVID-19 pandemic.

The interviews opened with a presentation of the academic project, explaining the anonymous treatment of respondents' personal and company data to encourage information sharing in a safe setting. Participants shared their experiences following a semi-structured interview protocol, including open and probing questions. After a brief introduction of their profile and professional backgorund, participants were taken to the topic of the digitalization of fashion SMEs and asked about the new digital business models based on digital service offerings, the organizational processes to adapt in the actual business context and how the relational approach with customers has evolved due to digital technology. The interviews proceeded with a retrospective exercise asking participants to reflect on the profound changes in the sector due to new market trends, the COVID-19 emergency, and the new opportunities offered by technology (Zeithaml et al., 2020). As a result, themes related to the drivers of digital servitization were identified and further discussed their implications for SMEs operating in the fashion industry. During the in-depth interviews, participants shared several anecdotes of specific events which were critical for accessing knowledge related to structuring social action-in-time and delivering a deeper understanding of the changes over time and after the discussed events.

The evidence derived from the interviews was enriched by information collected during their participation in two online webinars on the issue of digitalization of the fashion sector. Many professionals participated in these seminars, including CEOs and company managers, who contributed through their experience and by identifying the main dimensions of the digital servitization process in the fashion industry.

3.2 Data analysis

The interviews were analyzed to generate dimensions and find common topics among all the empirical material obtained (Yin, 1989; Eisenhardt, 1988). During the data analysis phase, it was used a manual coding procedure to identify, categorize, and connect the primary topics that surfaced from the interviews with the research goals.

Manual coding facilitated the rise to more conceptual and theoretical levels of analysis (Saldaña, 2021). In this way, it was examined the fashion industry gaining a holistic vision of the phenomenon of digital servitization that integrates heterogeneous and variable approaches. Through manual coding, it has been possible to have a direct and continuous interaction with the data. There is the opportunity to constantly compare them, modify theoretical perspectives, and develop different

interpretative insights. In this type of study, it is fundamental to deepen every possible interconnection and relationship between information, to move from micro- to macro-view perspective to generate high-level conceptualization.

The data analysis relied on the analytical procedures developed by Gioia et al. (2013) and Zeithaml et al. (2020) recommendations. The analysis is articulated into three key steps to ensure that empirical observations are linked to existing theoretical concepts and develop new insights (Zeithaml et al., 2020). Figure 1 illustrates the final coding structure.

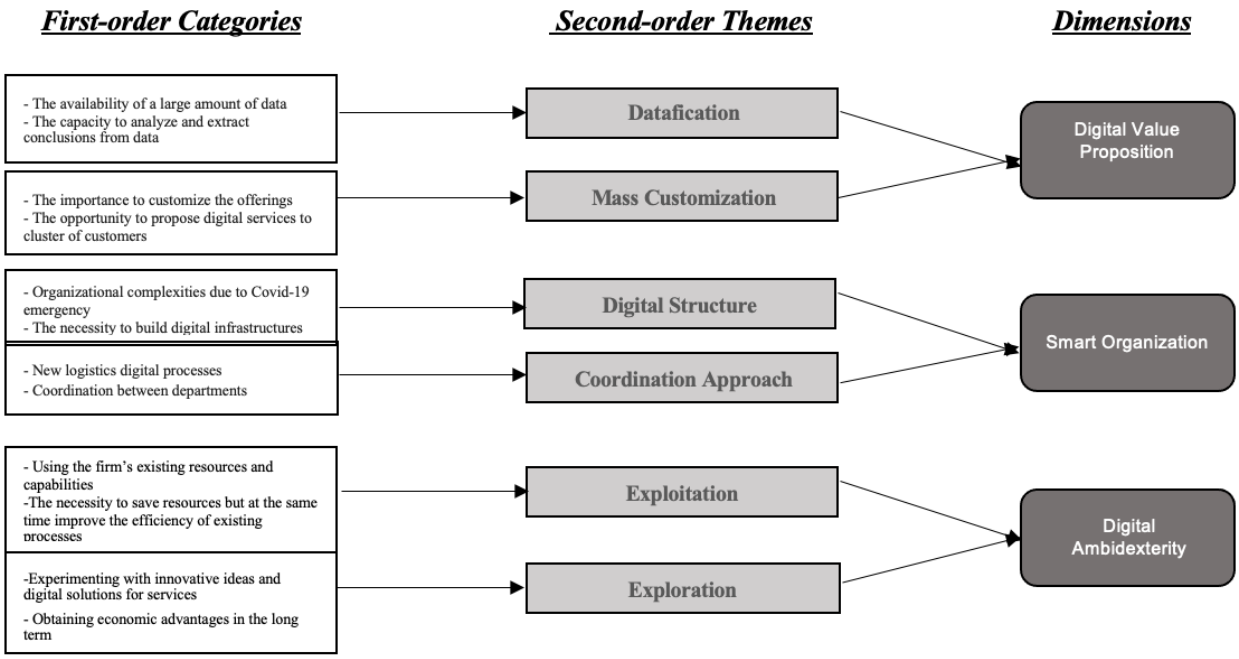

Figure 2 Coding Structure and Conceptual Model

Step 1: Open coding. A list of elements, events, and practices was created stemming from the participants' narratives in the study. Researchers discussed the identified categories to ensure consistency. Through open coding (Strauss & Corbin, 1998), meaningful quotations to the categories through the coding practice were assigned (Gioia et al., 2013). Similar codes were then merged to develop the ten first-order categories so that they reflect the informants' "concepts-in-use" (Zeithaml et al., 2020).

Step 2: Axial coding. Open codes were further analyzed in this step to uncover the core phenomenon and other variables influencing it (Strauss & Corbin, 1998). In this process, it was possible to go back

and forth between data and existing theory and link emerging themes to past literature (Gioia et al., 2013). Overlapping and complementary first-order categories were then clustered into second-order themes (Gioia et al., 2013) that represented key elements of the practices through which SMEs implement digital servitization processes.

Step 3: Selective coding and model development. Through selective coding, the second-order themes were unified around core categories; the categories were integrated and connected to develop an articulated model (Creswell & Creswell, 2018; Gioia et al., 2013; Zeithaml et al., 2020). The second-order themes were matched with the practical insights derived from the study. This process was reiterated until it was possible to develop stable aggregate dimensions at a higher level of theoretical abstraction (Zeithaml et al., 2020).

4. Findings

A conceptual model is proposed that contains the main drivers of digital servitization in the fashion context for SMEs, also considering the pandemic period. Three main dimensions are identified that represent the drivers of digital servitization for fashion SMEs: Digital Value Proposition, Smart Organization and Digital Ambidexterity. Each driver comprises a series of sub-dimensions: datafication, mass customization, digital structure, coordination approach, exploitation, and exploration.

4.1 Digital Value Proposition

During the interviews, it was noticed how SMEs, through the use of technology, can collect a significant amount of information that permits the creation of digital service offerings customized to the characteristics and the requests of the clients. Different managers outlined how digital services are based on a "new" data culture that permits the creation of unique solutions for users with respect to the product logic, which is linked more to standardization.

> *"Thanks to the structured use of digital software, I can collect more specific data about my clients. This allows me to customize the offer of services by proposing ad hoc solutions for each user. For example, during the last year, analyzing all this information, we understood that clients were interested in renting services. For this reason, we have provided this offering through our digital platforms. It has been a success"* (CEO, fashion company).

Managers perceive this aspect as an incredible opportunity for SMEs to overcome the classic product-based models of fashion, which require a flattening and, in some instances, depersonalization of the offer, in order to propose customized propositions. The digital ecosystem in which they offer their solutions furnishes them the opportunity to move towards the logic of service co-creation with their clients.

> *"We have traditionally been successful in creating unique garments, but now the market is moving toward service trends; these solutions need to be developed with our customers according to their needs. We understood the importance of co-creation through the incredible amount of data we manage to collect. We cannot propose to customers a total and unilateral solution; rather, we have to cooperate agilely to identify their needs as they evolve progressively"* (Marketing director, clothing company).

Customers, as an essential group of stakeholders, and the company are committed to developing truly unique and rewarding value propositions through the mediation of technology. This new mindset moves away from the business-centric view of value creation in the fashion industry, which considers clients as passive subjects of offerings unilaterally imposed by fashion firms, to a new mindset that actively leads customers in defining and delivering enhanced value, developing enriched and meaningful service experiences. This approach breaks the cycle of passive purchasing behavior by including customers in the value creation chain to design service offerings that build emotional bonds with firms. In this sense, fashion professionals affirm that to propose this valuable solution, it becomes fundamental to have a continuous dialogue with their clients, exchanging information and data to offer the most fitting service. However, as underlined in many interviews, creating unique solutions for every single customer would be unthinkable and excessively complicated for SMEs, hence the need to identify groups with similar consumption habits to target services to entire ranges. In this sense, technology becomes a valuable facilitator, allowing the categorization of specific characteristics. Without digital tools, it would become costly in terms of resources and human capital to use. In particular, AI facilitates this trend, permitting the gathering and analyzing of a larger amount of information in real-time and providing detailed analysis. In this sense, firms are moving towards the logic of Mass Customization in services through the exploitation of big data, providing perfectly personalized solutions for categories of customers. By coding the interviews and analyzing the results, two main sub-dimensions have been extracted: datafication and mass customization.

4.1.1 Datafication

In numerous interviews, managers outline how one of the main benefits of using technology in service offerings is the possibility of gaining an incredible flow of data and information to build unique solutions. This approach becomes central to understanding the customers' needs and behaviors and proposing the right digital value solutions.

> *"The digital tools grant access to a significant number of data that has allowed me to target service offers according to the needs of my showroom clients, such as guided digital visits or return services online"* (Marketing director, clothing company).

According to managers, the importance and centrality of data have also been boosted by the effects of the COVID-19 pandemic, which have given attention to the importance of personalizing solutions and offerings. Clients expect firms to propose digital services that are close to their requests. They search for new forms of interaction to create an intimate relationship with the brands, and to obtain this goal, they agree to exploit all the necessary information. The quantity of data that firms manage to gather is growing greatly, improving the sources and the typology of information gained, such as traceability details, color analysis, shape analysis, style analysis, visual analysis, and potential forecasts.

> *"I was convinced that there was a great attention to save data and personal information. Instead, especially in the fashion sector, customers agree to release the information to obtain the most suitable service solution to cover their needs"* (Marketing executive, footwear company).

Furthermore, managers affirm how customers, in the fashion context, are no longer tied to physical channels but they increasingly use digital ones, especially social media, to interact with them or to receive information; in this way, companies exploiting the right digital tools can easily have access to an incredible amount of information. CRM is essential to the datafication process, a programmable and automated system that, orchestrated by algorithms, shapes users' interactions to produce data that can be used for commercial purposes. However, technology by itself is not enough; SMEs need to be prepared to cover these multidimensional touchpoints, to maintain a continuous dialogue with customers, and to be able to interpret this information in the right way.

> *"Digitalization gives you access to infinite amounts of data; the problem, at least in my company, is that no one could interpret this data. This is why I had to hire new staff capable of analyzing this continuous flow of information and exploiting them to propose new solutions"* (Sales executive, clothing company).

As highlighted in many interviews, there is a challenge to overcome in analyzing these data. In particular SMEs, despite having acquired the latest technologies, in some cases fail to extract and interpret the correct information to provide innovative digital servitization solutions. It is, therefore, necessary to invest in digital tools and the human workforce that knows how to analyze information and draw beneficial results from it.

4.1.2 Mass Customization

According to managers, mass customization is connected to creating something for a larger audience but customizing it to suit consumer groups' needs or desires. SMEs desire to propose personalized digital solutions to customers with similar habits, behaviors, and needs; in this new digital-mediated environment, firms are searching for new ways to simplify their work and propose highly customized service. In such a way, those firms are moving into mass customization offers.
Technologies provide them with valuable instruments to move toward this new logic; AI software and IoT are functional in this process, allowing them to categorize specific characteristics and identify clusters of customers. AI plays a crucial role in revolutionizing mass customization; machine learning and deep learning algorithms can process data to identify similar patterns and relationships, allowing companies to provide personalized services that cater to individual tastes of consumer categories. This allows organizations to differentiate themselves from competitors and fosters customer loyalty and satisfaction. Without the use of digital tools, this personalization process would become excessively expensive in terms of resources and human capital to use.

> *"With the arrival of the COVID-19 emergency, all my clients searched for personalized services. However, I noticed how similar targets required the same digital services, such as (social renting of clothes, recycling services, and digital-assisted sales). For this reason, I understood that in my offerings, I could provide services that could be addressed to multiple categories of customers"* (Communication director, clothing company).

Furthermore, this process is connected to the idea that SMEs, especially in this complex period of emergency, need to simplify their work, and proposing different value offerings for every single customer would be excessively complicated. Instead, customizing fashion services or proposals for a group of consumers would be more functional in terms of costs, resources, organization, and human workload.

> *"Cause of the COVID-19 emergency, I faced many complications in my business activity. I wanted to maintain the proposition of customized digital services, but I managed through AI to create a common solution for the entire group of consumers"* (CEO, fashion company).

In almost all the interviews, it was noticed this tendency: SMEs are moving to digital service offerings customized for entire target categories following their interests and needs. However, this does not mean depersonalization of the offer since these solutions are built on customers' real needs and through their co-creation approach.

4.2 Smart Organization

During the interviews, most of the professionals outlined how the logic of digital servitization, and more generally of digital transformation, entails organizational changes that are not insignificant. Developing service offerings represents a shift that SMEs are also facing considering the COVID-19 pandemic that has redefined the logic of company organization. Professionals explained the importance of rethinking the entire firm structure to approach digital transformation in the best possible way and move towards digital servitization propositions as the leading solution for clients.

> *"To move from product logic to service logic, I had to change the organizational structures of my company. I had to redefine the internal departments and functions and integrate the technology in the whole company "* (Marketing director, fashion company).

Furthermore, during the interviews, it was possible to notice that SMEs are moving towards introducing integrated supply chains that allow for the automated management of internal and external processes to provide services the fastest way to their clients.

As a general vision, managers think that in the new business fashion ecosystem, it is necessary to create a new "smart" organization in the sense of building coordinated structures through the use of technology. However, this process is not perceived as a constriction but as an opportunity to innovate, actualize, and redefine the total structure to keep up with the times and better face the structural changes due to COVID-19.

In particular, in the current era of digital servitization, traditional organizational processes must be replaced with flexible and iterative agile approaches and structures, eliminating unnecessary bureaucracy and lengthy proceedings inside organizations through digital tools. This dimension explores firms' ability to govern digital servitization, improve coordination, react faster to immediate

changes, and improve flexibility, productivity, and dynamism. Two main sub-dimensions have been extracted, which are digital structure and internal coordination.

4.2.1 Digital structure

In the last years, managers considering the boosting of digitalization in order to offer a valuable solution to their customers have decided to redefine the internal organization through new digital infrastructures. According to the central vision of the respondents, the SME structure can no longer be linked to classic office logic, especially in light of the pandemic, which posed significant organizational issues and has completely undermined the structural identity of companies. The internal architectures that were previously physical should become digital, considering also the distancing politics and all the restrictions led by the Pandemic.

> *"With COVID-19, we had a period of organizational difficulties. We wanted to increase our offer by proposing digital services, but we did not have an internal structure capable of supporting this process. Integrating digital infrastructures at the beginning was complex and expensive, but it is bringing great results in the long and medium term"* (Sales executive, clothing company).

> *"Before Covid, we did not even have an internet connection in all offices; we simply called and organized ourselves to offer solutions to customers. We did not have cloud software to share information or organize our work. This approach derived from an old business concept that led to delays and complexity at a communication and organizational level"* (CEO, clothing company).

According to managers, in order to face these changes, it is necessary to adopt transformative processes to develop new modalities of working (such as virtual rooms or digital meetings). The aim is precisely to build ad hoc structures thanks to the integration of technology; this will not only speed up activities but also increase the level of efficiency within the company. As specified, digital tools and systems empower the company to improve agility in the whole value chain, as companies that provide digital services need to identify changes and respond quickly. Looking at it from this standpoint, technologies, particularly AI, can improve organizational agility, facilitating professionals in developing numerous activities, improving speed and readiness while reducing response times. AI can autonomously carry on repetitive tasks to lighten the work of professionals. Machine learning, specifically deep learning, can be harnessed to rapidly assimilate a broader range of information, observing how human executives behave and respond to gathered data and then

exploiting the knowledge acquired to autonomously carry out repetitive activities, generating quicker and more precise responses during the service provision. In this way, firms can innovate digital services that, by their nature, are dynamic and need arrangements in real-time; AI permits giving clients adapted content, immediately boosting organizational agility. This approach demonstrates the importance of innovating the organizational structure through new digital solutions and how human-machine interaction is necessary to boost processes and reduce human workload.

4.2.2 Coordination approach

According to the unanimous opinion of the respondents, technology or new digital infrastructures are not enough to propose valid digital service offers, but internal alignment processes must be developed by professionals to manage the relationship with the customer better. The provision of digital services requires numerous actors to collaborate; orchestrating business ecosystems for digital services is complex. It is necessary to develop coordination processes and internal dialogues across departments and with the various players in the value chain.

> *"During Covid, we implemented video tools and real-time technologies to offer our customers digitally assisted sales services in which the buyer could even finalize the order at the end of the call. However, we had coordination problems with the logistics sector every time we had to complete the order since we did not manage to contact them most of the time, and we did not know exactly how many clothes we had in stock, the sizes, the different textures. For this reason, we could not conclude the purchase"* (Retail buyer, clothing, footwear and accessories company).

In the opinion of the managers, the old structures linked to standardized office logic do not reconcile with the proposition of digital services; new synergies between different departments are needed. Firms have to overcome the traditional organization of departments divided into silos based on an outdated mentality characterized by hierarchy and authority towards new organizational structures based on agility, dynamism, and partnership facilitated by digital tools. The perspective to overcome is typical of small firms where head departments unilaterally decide the guidelines and all the other employees have to adapt; it is therefore necessary to move towards aligned, participatory, inclusive, and continuous exchange logics improved by technology.

> *"To manage digital services, it is necessary that all departments work in a coordinated way, that they cooperate simultaneously, the IT department, the creative departments with the sales and marketing departments and so on; for this reason, technology was fundamental to*

create continuous flows of exchange of information and alignment of business practices" (Marketing director, clothing company).

Organizational changes and alignment processes need to be designed by humans and facilitated by technology. Moreover, from what was stated by various managers, the issue of coordination also assumes particular relevance in light of the changes due to the COVID-19 emergency, which has raised organizational issues of great importance, such as social distancing, in which professionals and departments could not talk or interact immediately and physically.

"We have been offering digital services for years, but in the last period due to COVID-19, the situation has changed enormously. Before, it was enough to go physically to the warehouse or the product department and check the inventories the stocks. This is no longer possible. We need to talk, interact more, introduce new coordination processes, to not make mistakes and satisfy the customer as much as possible" (Marketing director, clothing company).

In this situation, coordination approaches are facilitated by digital dashboards that facilitate the continuous sharing of information, allowing aligned decision-making processes among all the firm's departments. Those platforms are visual and interactive systems designed to provide a real-time analysis of a company's situation, allowing the extraction of analytical insights and improving communication inside firms, creating a continuous exchange of data across departments.

Furthermore, from the interviews, it was possible to notice also that the significant organizational and coordination problems in proposing digital services concern the logistics sector. For this reason, fashion SMEs are starting to adopt Supply Chains that are connected, intelligent, and developed, thanks to the digitization and dematerialization of data.

According to managers, to increase competitiveness and speed up the processes, creating a well-connected network is essential, with IT systems incorporated into the logistics processes. These "new" interconnected supply chains perfectly fit the needs of SMEs during the COVID-19 emergency. In fact, these systems can manage market demand when the offer moves towards new solutions or when customers' needs change, by anticipating and supporting these sudden variables. In this sense, the supply chains interconnected with the sectors of logistics, marketing, sales, and product development, represent a plus, allowing an effective collaboration, to propose in the fastest way digital services to clients.

"Following the COVID-19 emergency, I realized how necessary it was to develop collaborative and organizational processes with the logistics department. There were huge

slowdowns, for this reason, I have implemented a new integrated supply chain that could facilitate all the teams to easily communicate each other's" (CEO, fashion company).

4.3 Digital Ambidexterity

During the interviews, it was highlighted how managers, in approaching digital servitization, dealt with the continuous interaction between the exploitation of processes, models, and knowledge already used, and the exploration of new approaches and digital solutions that are different and more advanced than those already employed.

> *"To approach new models of digital services, on the one hand, we had to refer to existing knowledge, processes, and technology, and on the other, we had to rely on new possibilities, new tools. It is necessary to balance what is already in use with acquiring new resources. This allows you to control costs and avoid unnecessary waste"* (Sales executive, clothing company).

The dimension of digital ambidexterity consists of the challenges regarding the simultaneous co-existence of established business processes and the rapid adoption of new value-creation activities enabled by digital transformation and new digital processes. Such "tension" arises, for instance, from the necessity to align short-term digital technology investments with long-term strategic business planning and digital capacity development.

> *"The new renting services and the related platform derive from an in-depth analysis of the sector and from our CEO's interest in adopting new business models; we, as a sales department, have integrated our knowledge already possessed in terms of digital sales with new digital processes acquired in the last period through specific courses that were provided to us, such as new inventory methods, automated management of returns and so on"* (Sales director, clothing company).

In particular, this dimension facilitates firms in facing complications related to the integration of digital advancements into the established business model of fashion organizations, as well as the ability to change the organization's mindsets, and processes to respond to ecosystem changes and new trends. The combined exploitation-exploration capability seems to be a necessary condition for firms pursuing a digital servitization strategy. It permits balancing both capabilities to be efficient in managing today's business while also being adaptable in coping with tomorrow's changes.
For instance, this approach is used chiefly by SMEs because of their lack of resources – mainly financial resources and digital capabilities. To generate innovation, those firms initially opt for

adjustments and alignments, which are obtained thanks to the ability of managers to reconfigure existing activities and challenge traditional approaches. The company does not have to make a choice between incremental and radical innovation but must structure itself to be able to manage both approaches, exploratory and exploitative, with appropriate initiatives and suitable organizational systems. The previously mentioned dimensions of exploitation and exploration jointly arise as particularly relevant in determining the digital servitization process of firms through a combination of internal and external capabilities and resources.

4.3.1 Exploitation

Exploitation capacity for SMEs operating in fashion entails using the firm's existing resources and capabilities creatively, encompassing productivity and efficiency to revise the current offerings, modify processes, take advantage of existing market opportunities, and develop incremental innovation in order to improve, strengthen, and increase the company's offering, making use of pre-existing resources and skills. It requires firms to improve and expand the use of internal assets to boost the efficiency of their current operational capabilities. However, exploitation is about researching efficiency in service approaches through the editing of current offerings and processes as a way to improve processes and profits in the short run.

> *"We understood how much people want to approach the world of luxury, in many cases not having the resources, so we decided to complement our offer with rental services; before making too expensive investments, we, therefore, took advantage of our skills and technologies already in use (dashboard, CRM) to create virtual marketplaces for the exchange and renting of clothes and accessories"* (Fashion designer, clothing company).

> *"Due to social distancing policies, we understood that physical sales would be highly compromised; we, therefore, leveraged the skills of our employees to create online sales processes using video calls, social media, and online platforms currently already known. To increase the customer experience, we also provide styling consultancy services for online sales. This has allowed us to remain competitive in complex moments by taking advantage of the technologies and tools we already have"* (Sales executive, clothing company).

This approach is particularly central for SMEs that are initially reluctant, do not have many resources to use, or in any case, want to exploit what is already known before approaching more complex and expensive processes; it is also essential to know how to exploit and make the most of the resources already owned to improve services and associate greater value with them. Also, the essence of

exploitation is the improvement and expansion of existing skills, and the results associated with it are positive, immediate, and predictable. It is notable that, in the initial phase, the organization still tries to make small changes to what they usually do, as incremental innovation is preferred.

> *"During the emergency, we understood how obsolete our business model and our offer were; we wanted to approach services but initially we wanted to test the waters and understand how far we could go. For this reason, we implemented the technologies we were already using, improved the online channels, and made the most of the potential of CRM and dashboards, which were previously considered marginal. If this first approach had gone well, we would have invested in tools such as AI, VR, or AR to provide our customers with the maximum experience level"* (CEO, clothing company).

> *"With the arrival of the pandemic we wanted to adopt an online sales platform as we could no longer resort to physical interaction. The costs were too high, there was a lot of demand and the software houses offered us very high quotes. We couldn't afford those solutions, we had to organize ourselves with self-made methods through video calls and online assisted sales"* (CEO, clothing company).

SMEs pursuing primarily exploitative activities seek to make incremental improvements and innovations to existing products and technologies to adapt them to changing environmental conditions or new market segments. Returns are closer and more predictable, but exploitation can lead the organization towards obsolescence as it cannot respond adequately to the most significant changes. It is not enough to know how to make minor improvements and increase efficiency if, on the other hand, SMEs do not experiment, seeking novelty and originality; hence, the centrality of the second subdimension exploration.

4.3.2 Exploration

It refers to creating new knowledge and processes by experimenting with innovative ideas for services and technologies; all the managers agree that exploration is the search for business alternatives, cutting-edge technologies, skills, markets, or relationships. Exploration concerns risk; it is about innovating with disruptive ideas for services and cutting-edge tools, but the returns from exploration are less certain and distributed in the long term. This approach in experimentation can lead to uncertain and also even negative returns. The approach is determined by the capacity to seek, acquire, and attract external resources.

"With the arrival of the pandemic, production processes were extremely limited due to restrictions and the lack of raw materials; therefore, we converted our model from product-centric to service-centric by implementing new digital tools and skills for our employees. We have converted our business to a garment recycling and remanufacturing system, facing the new trend in sustainability. It involved a large initial investment in the reconversion of production systems, working methods, new resources, and skills, but we expect a significant return in the long term. We also had to invest in new networks with other partner companies and review the entire logistics to adopt this type of service" (CEO, clothing company).

Firms explore new opportunities, such as the experimentation with digital showroom stores to enhance consumers' shopping experiences and integrate platforms to secure themselves for the future. Today, exploratory firms are increasingly applying new technologies like AI or IoT to further automatize different work processes and improve human-machine approaches.

"Due to the strong competition, we have understood how important it is also to provide services to our customers to increase our offer; we have therefore implemented VR and AR technology into our platforms to create virtual fitting rooms where customers but also professional buyers can virtually try on clothes without physically going to stores. It is like having a virtual fitting experience at home or office, where you not only can visualize the item on yourself before purchasing it, but you also can know how it will fit you. The initial effort was both economic and workforce; we have organized courses for the exploitation of the new technology, and we have hired new staff. However, we managed to cover our expenses and expand internationally by acquiring customers from abroad" (CEO, clothing and accessories company).

Augmented retail in digital services enables ultra-personalization for customers, connecting the experience in physical stores and bringing it together with the advantages of the online and digital selling process enabled by data.

As it appears clear, explorative firms constantly research for new service business opportunities. In fact, exploration is vital for developing advanced services, as opposed to exploitation, which is more associated with basic services and tools.

5. Discussion

COVID-19 has highlighted how digital transformation is now endemic to today's business reality (McKinsey, 2020). The fashion sector was one of the most affected by the emergency, being an

industry still linked to the materiality of the product and to direct and physical interaction with customers, in which digitalization was considered a form of product depersonalization. However, in the last years, the old operating models have changed towards new digital propositions.

These transformative processes have mainly affected the SMEs that were not ready for this radical change and meant a disruption of their operating models (Urbach & Röglinger, 2018). However, not taking these processes into account entails the risk of losing the position in the market and, in the most serious cases, becoming obsolete and failing (Bock et al., 2012).

SMEs need to rethink their entire structure, their offer, and their relationship with customers instead of the big brands that have already worked on these transformative processes for some time. These companies initially showed complexity in managing digital transformation processes but have now realized how many operational and cost advantages they could obtain. Furthermore, with the boosting of digitalization, the market is moving toward new digital servitization logic based on a high level of customization (Adrodegari & Saccani, 2017; Ardolino et al., 2018) and this can represent an advantage for SMEs which, knowing how to exploit the opportunities of this period, will be able to reposition themselves in a constantly evolving and changing market.

This study makes different theoretical contributions. First of all, it investigates the digital transformation processes of fashion; it fits into the recent debate in the literature on digital transformation and its acceleration due to the Covid-19 emergency and sheds light on the fashion system and, in particular, on the SMEs segment that to date still appears to be under-investigated (Gonda et al., 2020). In detail, the study analyzes and produces theoretical advances in one of the most used approaches currently used by fashion companies and SMEs of digital servitization. Despite the increasing attention on the topic (Kohtamäki et al., 2019; Parida, et al., 2019), little is known about the drivers and dimensions that lead firms to approach a digital servitization strategy in the fashion context. To date, the literature has focused on the technical features of servitization (Frank et al., 2019; Coreynen et al., 2017) and the financial outcomes deriving from this shift (Kohtamäki et al., 2020). However, it still lacks the theoretical foundation to explain the main dimensions of digital servitization (Kowalkowski et al., 2017b); this study offers new insights into the reference literature by investigating its drivers with a holistic approach considering both an internal and external perspective.

From the analysis of this paper, it is possible to notice that the main dimensions affecting digital servitization models for SMEs are three. The first is the Digital Value Proposition, which refers to the capacity to innovate the offering with new solutions. More specifically, it concerns the ability of companies to use and analyze data correctly to identify customized solutions for clusters of customers with common characteristics, needs, and consumption habits. Technology is, therefore, a facilitator

of primary importance in this process of co-creation of value (Bharadwaj et al., 2013; Matt et al., 2015), which is based on the information collected but also on a continuous process of interaction between customers and companies; a reciprocal exchange that brings benefits to both, the first ones can take advantage of the services they need, but also firms can develop lasting and intimate relationships with multiple targets.

Among technologies AI and IoT are profoundly revolutionizing the sector through their capacity to gather, store, and analyze unstructured data, automate consumer segmentation at scale, and provide real-time analysis and predictive consumer trends. Those functionalities facilitate mass customization approaches, “creating something for a larger audience but customizing it to suit individuals' needs or desires” (Forbes, 2022; McKinsey, 2023). Although AI and mass customization in the fashion industry are still in the initial stages, they have demonstrated their potentialities.

Furthermore, digital servitization requires SMEs to innovate their organizational structure internally and externally. Hence the relevance of the second dimension of the model, Smart Organization. This is an essential driver since it includes new techno-mediated processes where digital (such as interconnected supply chains) creates non-physical infrastructures, leading to more significant internal coordination and efficiency (Zhou & Shu, 2010). So, it is required for SMEs to undergo a total transformation; they need to identify and include the most relevant technology in their organizations, to create an agile internal structure to propose digital services to clients in the fastest and most effective way. Agility and dynamism are two fundamental organizational improvements that technology is leading to the fashion sector; in particular, AI can autonomously execute repetitive tasks, resulting in faster and more accurate responses throughout the service encounter (Goodfellow et al., 2016). In this manner, companies can provide innovative services that include dynamic and real-time adjustments through technology with a reduced human workload. The utilization of AI reduces the time for reconfiguring the service while also providing clients with personalized content instantaneously, facilitating the development of organizational agility.

As already specified, in addition to introducing digital internal structures of companies to create digital services, it is also necessary that the operators define and implement coordination processes at an intra- and inter-organizational level. Companies need to abandon the old logic of structures organized in silos and move towards collaborative partnership models both internally and externally within the company ecosystem; visual dashboards can quickly increase the level of alignment, facilitate decision-making processes and manage processes more quickly.

The third dimension, labeled for the aim of this research as Digital Ambidexterity, confirms that both exploitation and exploration approaches are associated with firms pursuing a digital servitization strategy. The study, therefore, also makes theoretical advances on the link between ambidextrous

approaches and digital servitization. It appears necessary for SMEs to exploit existing competencies and knowledge to develop incremental innovation and explore new business opportunities to foster radical innovation (Chirumalla et al., 2023). With the capacities of exploitation or exploration, for instance, by modifying current tools or adopting breakthrough technologies, firms are more likely to innovate through digitalization, servitization, or a combined digital servitization strategy. This permits them to face environmental changes, external factors, such as shifting technologies that may compromise their position in the value chain (Vendrell-Herrero et al., 2017) and other suppliers competing to undertake customers' increasingly heterogeneous requests (Raddats et al., 2016).

Nevertheless, it is essential to highlight that while digital servitization already plays a crucial role in the fashion sector providing many benefits for firms, it also brings different challenges. First of all, SMEs still seem to struggle to change the product-dominated culture and organization; fashion firms that want to compete with services have to change their internal company's culture. Companies need to develop a more service-oriented mindset (Rapaccini et al., 2023) and a strong orientation towards digitalization. Another challenge is the increase in costs for several reasons; first of all, the acquisition of additional machines and cutting-edge technologies. Delivering digital services requires considerable resources in developing new capabilities in both back-end and front-end units because dealing with digital services is different from the organization's everyday business. In particular, it entails training on using digital systems and systematic approaches to refining work processes and routines (Kowalski et al. 2022). Activities encompass skills-based training, knowledge-based education, and operational experience for frontline staff to ensure that they effectively can provide the best experience for their customers. For example, developing routines and processes for teams to use digital platforms, CRM, or AI can require considerable investment in understanding user needs and customization. Moreover, digital systems require management and maintenance costs. Considering that the operability of software, systems, and sensors must be updated regularly as technology continuously improves and customer demands constantly change, these activities also need to be undertaken with the support of third parties and external software houses.

Finally, digital servitization may be risky for SMEs that have limited resources; investments are not always paid back or in the long run, especially in highly competitive industries like fashion (Michalik et al., 2019). Smaller firms might not reach the minimum scale needed to obtain profits from services and from digital services (Confente et al., 2015; Michalik et al., 2019).

6. Conclusions

Digitalization is more central than ever due to the profound changes generated by COVID-19 pandemic. This transformation has strongly affected the fashion industry. In particular, SMEs were

less ready for this radical shift and experienced a disruption of their operating models (Urbach & Röglinger, 2019). In this scenario, firms need to act quickly to redefine business models, adopting digitalization as the leading resource. However, in many cases, those companies still struggle to apply technology-mediated approaches and necessitate guidelines and best practices.

New transformational processes that the fashion industry is experiencing and the accelerations due to COVID-19 have led SMEs to rethink their operating models and product offerings towards new digital servitization solutions. This research enriches the mainstream studies on digital servitization, which still have some gaps at the academic level—also considering that this paper takes into consideration the fashion context that has particular and different functional processes compared to other industry.

Furthermore, the model developed contains the main drivers to approach this process providing a solid empirical value for managers who desire to approach digital servitization as a new business model. The framework presents operable practices that can be used strategically to reposition a company in the value system approaching the digital services market. In particular, this research may help managers answer questions like "What strategic practices should be utilized in our digital servitization approach?" "How should our organizational and operational capabilities be modified?" This research helps managers operating in fashion to understand what dimensions, organizational processes, competencies, and knowledge should be implemented in maintaining and establishing digital services to obtain advantages considering the pandemic's complications. It also highlights the potential of cutting-edge technologies like AI, IoT, CRM and visual dashboard in favoring this process, providing insights and strategic approaches to managers.

The research, however, has limitations; it is an exploratory study carried out in a phase in which the pandemic was still ongoing. Considering that since we are still leaving this period of uncertainty, new changes will occur to the sector. Therefore, this study, though one of the few to contribute to the theoretical underpinnings of digital servitization, only scratches the surface of the drivers of digital servitization. For this reason, further research will be necessary at a later stage to broaden the scope of this study, given the evolution that these processes will have, to widen the discussion with new insights from different stages of the pandemic scenario implementing different analysis methodologies.

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PAPER 3

Exploring digital transformation in the fashion industry

Abstract

The fashion industry is characterized by heterogeneous approaches to digitalization and firms that often experience complexities due to structural and cultural barriers. To date, few studies have analyzed this topic; more specifically, the key dimensions that boost such transformations are not clearly evident.

This study explores the phenomenon of digital transformation of small and medium enterprises (SMEs) in the fashion industry and identifies the drivers of digitalization and different digital transformation approaches. Based on 25 in-depth interviews with fashion SMEs managers and an online survey of 207 companies, the findings identified seven key drivers of digital transformation of SMEs in the fashion industry that translate into four approaches to that process - the Cautious Explorers, the Unaware, the Novices, and the Digital Champions.

This study provides a holistic understanding of digital transformation in SMEs operating in fashion, while considering the role of different actors and key contextual elements.

Keywords: Digitalization, Digital Transformation, Fashion, SMEs, Innovation.

1. Introduction

Over the last years, digital transformation has revolutionized the way that organizations conduct business and develop relationships with their stakeholders. Digital transformation is defined as the process of leveraging digital tools and implementing techno-mediated solutions to enhance the efficiency of business operations and their economic transactions (Warner & Wäger, 2019); it is a multidisciplinary approach to change that firms face so as to benefit and adapt in changing competitive and dynamic scenarios through the exploitation of different technologies.

One of the industries currently fully embracing digitalization is fashion (Chakraborty et al., 2020). In the last few years, organizations in this sector have undergone transformative processes to adapt to a mutable environment further complicated by the effects of the Covid-19 pandemic that highlighted even further the necessity to approach technology as a primary resource to use to modify business models. As specified by Mouzas (2022), discontinuous changes, such as natural disasters, pandemics,

digital shifts, and economic crises, may generate risks for the survival of firms; companies thus need to carry out profound innovation for business transformation to prosper and even sometimes to survive.

The context of fashion is particularly interesting to study. As despite being one of the sectors with the highest revenues globally, it still lags behind in its approach to digital transformation (McKinsey, 2020). This issue also highlights the paradoxical nature of fashion, considering that even if the actors in this industry declare and pursue speed and novelty in their operations, the industry itself is slow to change and innovate away from the practices that were developed in the mid-20th century, particularly taking into consideration both sustainability and digital technologies (Geczy & Karaminas, 2018).The fashion sector requires deeper theoretical studies, taking into account the profound changes that digitalization has led to for firms in terms of the transformation of business models, operational processes, the relationships with customers, and supply chain improvements (Chakraborty et al., 2020).

Further, fashion companies are today approaching digital transformation at different levels. There are big groups or multinationals that, over time, have adopted technology as a lever for change and innovation. There are also SMEs that, in most cases, still struggle to innovate (Quinton et al., 2018). SMEs face increased complexities when adopting new tools because of the lack of needed resources, competencies, and a proper understanding of the value that technology can actually generate (Giotopoulos et al., 2017). Perceiving new digital opportunities is fundamental to improving business operations, facilitating customer interactions, and co-creating value with stakeholders, the critical success factors for those firms (Matarazzo et al., 2021). However, the adoption of technologies, especially the most advanced ones such as AI or Big Analytics, poses serious questions and complexities and requires a change in the management mindset, new entrepreneurial visions, the investment of capital, and the acquisition of additional new specialized capabilities (Silvestri, 2020; Jin et al., 2021).

The extant research has broadly explored the implementation of digital technologies in large corporations (Cenamor et al, 2019) or innovative businesses (Ghezzi and Cavallo, 2020); however, specific studies focusing on SMEs operating in the fashion context are still relatively scarce (Gonda et al., 2020). Furthermore, most of the previous research has not contemplated the transformative changes caused by the COVID-19 pandemic, which still further boosted many digital transformation processes. Thus, fully understanding how SMEs that are operating in fashion utilize technology to shape their business transformation requires more in-depth investigation.

The main goal of this research, therefore, is to examine how small and medium companies are undertaking digitalization processes through using a holistic lens that is not limited only to the technological dimension, but also taking into consideration the role of the players as well as contextual external elements. This research intends to deeply analyze the drivers and the barriers for SMEs for exploiting digital innovation and the different approaches taken in developing such techno-mediated solutions. To analyze these elements, the research is based on a multi-method approach, including a qualitative study carried out in 25 semi-structured interviews with CEOs, marketing, and sales professionals and a quantitative segmentation study via a survey of 207 Italian companies. This study identifies 7 drivers regarding the digital transformation processes of SMEs operating in fashion. Based on these dimensions and using a Latent Cluster analysis, the research explores four different approaches to digitalization by also considering the related opportunities and challenges for each approach.

This research makes several important contributions to the existing scientific studies. It enriches the digital transformation literature and well fits into the discussion on the evolution of the fashion sector with a particular focus on SMEs, thereby providing a rich context for further study of the impacts of COVID-19 on this particular industry. In addition to its theoretical implications, this study has practical importance by supporting professionals and firms when conducting digitalization in a clearer way, giving relevant guidelines to help them through this phase of transition and gaining further advantages in the coming post-pandemic scenarios.

The paper is organized as follows. Section 2 provides the theoretical framework related to the digitalization of SMEs that are operating in fashion and the relative driving factors of this process. Section 3 explains the research design and methods for both qualitative and quantitative analysis. Section 4 highlights the major empirical findings and discusses the principal outcomes. Finally, Sections 5 and 6 present concluding remarks and the managerial implications of the research overall.

2. Theoretical Framework

2.1. Digital Transformation of SMEs in the Fashion Context

In recent years, the role of small and medium-sized enterprises has drastically increased not only at the national level, but also at the European level (Gonda et al., 2020), thereby providing significant contributions to economic growth, job creation, and, thus, the social welfare. Manufacturing firms, particularly SMEs that are operating in fashion, are undergoing drastic innovations due to phenomena like globalization, global competition, and digital transformation (Bettiol et al., 2022).

Academics have used the term, digital transformation, to express these radical changes in organization, strategy, supply chain, marketing, and sales activities that are influenced by digital

technologies (Verhoef et. al, 2019; Gadde and Snehota, 2019; Burki, 2018); it is an innovative and iterative approach that is affecting the essence of many firms' operations, leading them to renovate beyond new structures, and have new offers in terms of products and services that they provide (Piepponen et al, 2022).

The increasing interest in digitalization has generated numerous and interdisciplinary researches on a wide range of concepts that refer to digitization, digitalization, and digital transformation (Verhoef et al., 2021). These terms are often used as synonymous, but recent studies also highlight that they should be considered as distinctive concepts, as subsequent phases, where digitization indicates the transition from analog to digital data, digitalization refers to the exploitation of digital tools to modify business processes, and digital transformation indicates the wider organizational change that is occurring through techno-mediated approaches and leading to new business models (Hanelt et al., 2021; Reushl et al., 2022) and different value propositions (Wessel et al., 2021).

Fernandez-Vidal et al., (2022) clarified how digital transformation represents a strategic priority for most organizations and thus requires companies to become more agile and redefine their entire structure and processes (Ferraris et al., 2021; Kraus et al., 2021). However, despite the importance given to this phenomenon, most firms, in particular SMEs operating in manufacturing and fashion, still are struggling to approach techno-mediated solutions due to their lack of specific competencies or marketing expertise to more easily adapt to those changes (Dethine et al., 2020; McKinsey, 2021). Many authors have highlighted that SMEs' complexities when facing digital innovation are either external, related to the business environment (national or international market), or internal, and, therefore, connected to the limited resources, limited competencies (Paul et al. 2017), organizational structure, and the overall vision of the company (Cerrato and Piva, 2012).

First of all, the integration of technology requires strong and strategic investments with a clear and specific plan in place. However, SMEs generally invest in digital tools only as the need arises, without any real strategy or defined planning or program. This approach, which is based on a short-term vision, represents an opportunistic response to scale digitalization, and in most cases, also generates errors in investment. SMEs generally aim at solving an immediate problem or satisfying a sudden need rather than aiming for a profound transformation that improves the entire value creation associated with the digitalization of the entire company. Financial barriers are common, and they largely depend on cultural biases since SMEs do not perceive the value that technology can bring, although they do remain focused on the risk of losing their investments. Furthermore, those companies are still anchored to the idea that fashion is connected to craftsmanship and the adoption of technology can compromise this aspect.

Von Leipzig et al., (2017) further clarified that, in addition to economic obstacles, a lack of competencies and skills related to digitalization, as well as a lack of business strategy, may become a missed opportunity for digital transformation. The "human factor" should always be considered (Goerzig & Bauernhansl, 2018) by firms that decide to approach digital transformation; digitalization requires a clear interconnection between a firm, its offerings (product or service), and its employees. The workforce and the managerial figures represent the individuals who become the bearers of this radical transformation and, only their knowledge, can allow the advancement and modernization of the business models of these companies. Thus, despite the cultural barriers and structural and financial complexities (Amankwah-Amoah at al., 2021), SMEs operating in the fashion sector now perceive digitalization as an ongoing process that must be taken into account and which can also bring positive benefits in economic terms (Corò and Volpe, 2020). In particular, small and medium companies do comprehend that during this phase of uncertainty, caused by the effects of the Covid-19 emergency and other exogenous factors, that innovating their business models and the advanced use of technology may produce valuable competitive advantages. Indeed, approaching digital transformation for fashion firms is not a choice anymore. In fact, many companies that have not adopted structural changes during the last two years have been forced to close due to the disastrous consequences of COVID-19 (McKinsey, 2020). Despite initial complexities, SMEs can realize the numerous improvements that technology produce even if they are still disorientated on how to embrace these innovations. In particular, digitalization is facilitating firms across different layers, at the production level (in the development of new systems for designing and item creation), at an organizational level (improving new systems for internal and external coordination), at an interactional level (defining new forms of relationships based on techno-mediated approaches), and at an operational level (improving new marketing and sales strategies) (Piepponen et al., 2022; Rocamora, 2017; Eller et al., 2020). First of all, improvement in product development concerns the virtualization, and optimization of production and the supply chain, improving flexibility and the customization of items through the adoption of innovative tools via virtual printing and mapping through 3D models, Cad (Jin et al., 2021; Jain et al., 2021). This approach facilitates the automation or semi-automation of operational processes through robotics, thereby decreasing the costs carried by companies. Further still, Artificial Intelligence systems and the exploitation of Big Data let firms propose new offerings with the creation of new product solutions, services or extra functionalities that are now highly customized (Ferreira et al., 2019; Chatterjee et al., 2022). Technology also improves firms' organization, and digitalization facilitates internal coordination through platforms or dashboards to correctly manage processes among the various departments with continuous updates and exchanges of information.

This aspect is particularly important considering that fashion companies operate on multiple levels: production sectors (often outsourced to companies), commercial sectors, and logistics and supply chains. Therefore, the physical management of information is no longer conceivable, but centralized and digital data management is needed to allow a real-time display of necessary data.

In fact, digital tools, and in particular, ICT systems adoption, will facilitate strategic cooperation between companies that have complementary resources and capabilities (Cassetta et al., 2019).

Further still, at the organizational level, technology also generates positive consequences in supply chain management, by considering the complexities caused by the emergency. The COVID-19 pandemic has highlighted even more the unsuitableness of existing supply chain models in fashion due to the provisions taken by many countries to limit the diffusion of the virus, including the limitation of production centers in supplier countries, a lack of stock, and the suspension of international exchanges. This theme gains even more primary importance in fashion when considering the distinctive characteristics of this industry, such as the shorter life cycle of many items or volatile customer requests (Sarma et al., 2021). In this sense, technology also represents an enabler since the use of big data or AI software makes it possible to define sustainable and agile supply chains and face real-time changes and also limit the costs and time to market (Ivanov and Das, 2020)

Digital tools also facilitate external coordination in the wider ecosystem of SMEs. The increasing number of relationships with new actors and players generates complexity, and in this regard, there are valuable new tools to manage these interactions. In particular, the functionalities of CRM are becoming increasingly crucial for companies, as they provide the flexibility to manage commercial contacts with stakeholders and other players in the ecosystem (Saura et al., 2021). CRM also improves the effectiveness of the relational processes by automating repetitive and time-consuming tasks, such as interacting with multiple clients or optimizing the quality of interactions with stakeholders through deeper customization of each relationship, personalized communication, or direct activities of cross-selling and up-selling. In this sense, the use of technology also facilitates the ability to cut back financial and human resources costs.

Mouzas (2022) specified that "interaction represents an opportunity for firms to explore heterogeneity, overcome cultural, organizational, and technological barriers to business transformation, develop a communicative rationality, and build consensus in business networks" (Mouzas, 2022: 283). The expansion of the relational ecosystem of SMEs is also facilitated by digitalization which enables firms to find new partners and expand internationally, shortening the distances across foreign markets and industries (Runfola et al., 2022; Feliciano-Cestero et al., 2023). As Corsaro and Azivino stated (2021)

that technology has reconceptualized the temporal and spatial dimensions in which companies operate. This is also a consequence of the pandemic, which made companies' boundaries more blurred, thereby generating great possibilities to enter international markets.

Finally, digitalization facilitates SMEs in carrying on more advanced marketing and sales strategies (Guercini et al., 2018). Virtual and Augmented reality and the development of e-commerce have transformed the "classical" selling model into hybrid sales solutions where actually clients live immersive buying experiences. As specified by Santy et al., (2021), commercial dealings are transposed from being a physical context to becoming a digital one, and as a consequence, new online markets and spaces are being implemented, as in the case of Metaverse, in which fashion firms are experimenting with different forms of interactions with stakeholders (Park et al., 2022).

Those tools help firms experience a deeper level of the learning process and a higher degree of customization of items, diversify their offers, enter the cross-border market, and access new categories of consumers. In this context, SMEs need to be more inclined toward adapting to this new technological panorama to remain competitive or even to enter new markets (Jafari-Sadeghi et al., 2022; Safar et al., 2018). Considering the numerous barriers and cultural biases, SMEs require guidelines to approach a digital transformation strategy that impacts the entire company organization and successfully so.

2.2. The Drivers of Digitalization for SMEs in the Fashion Industry

The implications that technology brings are various, both in terms of benefits and the complexities that must be handled. It is also necessary to analyze the drivers when approaching digital transformation. Among these are the structural and economic conditions of companies, the human capital, digital competencies and technology literacy, integration, exploitation of knowledge, strategy, and company know-how (Zahra et al., 2020; Corò and Volpe, 2020; Rafiah et al., 2022).

The first factor that affects the digital transformation of SMEs that are operating in fashion concerns the firms' conditions and financial capabilities. The number of employees and the structure of companies determine the necessity to choose to adopt digital tools to facilitate operational processes. Moreover, costs represent a challenge, considering that the lack of budget or resources available to allocate is a common problem for both small and medium enterprises. Another factor that influences the digitalization processes of SMEs in the manufacturing and fashion context concerns Human Capital, which includes both the top management of the company and the employees (Thite, 2022; Jafari-Sadeghi et al., 2022). Digital transformation leads to a radical workforce transformation, and firms thus need to redefine their talent management practices and competencies (Sousa & Rocha,

2019; Porfírio et al., 2021). In this process, SME leaders play a central role; in most cases they are the final decision-makers, and they determine what technologies to implement in their organization. The function of managers is central to ensuring the success of digitalization processes in these firms. In particular, managerial figures define the strategic direction of the business transformation and guarantee successful coordination in the adoption of new technologies (Kunisch et al., 2020; Bresciani et al., 2021; Malodia et al., 2023; Zahoor et al., 2023). As specified by Fernandez-Vidal et al., (2022), managers and senior executives are expected "to be business strategists and change-makers, ensuring the effective transformation of existing businesses and enabling or even building new ones" (Fernandez-Vidal et al., 2022: p. 30). For this reason, leaders' mindsets and competencies are fundamental variables in the innovation processes of firms. Some of the most important skills requested of CEO or managerial figures in the digital age are organizational agility, technical know-how, and emotional intelligence (Cortellazzo et al., 2019; Usai et al., 2020; AlNuaimi et al., 2022). C-level professionals need to be agile by predicting market opportunities and trends derived from technologies and taking advantage of them with both rapidity and flexibility. In this way, firms will be able to respond to new customer demands and market volatility (Chak- ravarty et al., 2013; Schwarzmüller et al., 2018; Bresciani et al., 2021; Shams et al., 2021). During this period of broad transformations, also due to external factors (Chen and Tian, 2022), such as the emergency, managers need to develop speediness in their decision-making and development of their problem-solving capacities (Singh & Hess, 2017; Cortellazzo et al., 2019; Sousa & Rocha, 2019; Verhoef et al., 2021). Second, managing disruptive change requires strong digital capabilities (within the management team and/or the organization) and a deep understanding of how technologies can function to define long-term strategies for the entire company (Cortellazzo et al., 2019; Ferraris et al., 2019; Verhoef et al., 2021). Finally, managers need to develop soft skills, in particular, emotional and social intelligence competencies to be able to face change in their organizations successfully (Singh & Hess, 2017; Cortellazzo et al., 2019; Usai et al., 2020), as well as strong networking and relational capabilities (Sousa & Rocha, 2019; Verhoef et al., 2021). Employees also play a crucial role in the technological development of SMEs. In fact, a highly skilled workforce allows companies to support innovation through well- structured competencies, in-depth knowledge of how these tools work, and a positive willingness to change (Scuotto at al., 2021). It is, therefore, not only a question of possessing hard skills for the management of techno-mediated approaches but also the ability to adapt and the flexibility to embrace new innovative solutions. The incapacity of SME's managers and human resources to approach innovation effectively is one of the main reasons why digital transformation initiatives fail (Correani et al., 2020).

Another driver to consider regarding digitalization is integration, defined as the degree of integration of distribution channels and the management of both internal and external sources of information (Prajogo et al, 2018). Integration can be both vertical and horizontal. Vertical integration defines the cross-linking of information and digitalization within the different departments and diverse hierarchical levels of a firm (Stock and Seliger, 2016). Vertical integration is achieved when all information systems are integrated, meaning that they can exchange data in a multidirectional way. The fact that different departments still act as separate silos can become a threat to digital development and the plan to achieve more efficient internal data sharing and integration. CAD, CAM, document management, ERP systems, and CRM represent the most used applications for positive data integration. Alternatively, horizontal integration provides the formation of an ecosystem through a fluent flow of information, financial statements, and material among companies (Wang, et al., 2016). This is a case of having successful ongoing integration of data with customers, suppliers, and other stakeholders. Finally, Exploitation and Exploration are also driving factors in the digital transformation processes of SMEs operating in fashion. The first involves the use of explicit knowledge and information, such that by internalizing and combining them to improve business practices, efficiency increases and the firm better satisfies customers' needs (Lubatkinet al., 2006). Exploitation seeks to respond to external and environmental conditions by adapting existing competencies to face innovation processes successfully (Harry & Schroeder, 2000). In contrast, exploration involves the research of different knowledge bases and new technological adoption, as by externalizing and combining them, the company can find new approaches and develop creative ways to satisfy their customers' needs (Lubatkinet al., 2006).

3. Methodology

A two-stage study has been conducted that combined qualitative and quantitative research methodologies. Table 10 provides a summary of the methods applied for each stage. The mixed methods approach offers researchers the flexibility to design a study that addresses inquiries concerning the nature of phenomena from the participants' perspectives, while also exploring the relationships between measurable variables. Many studies focusing on mixed methods endorse a pragmatic approach, emphasizing the importance of using whatever methods are effective for investigating, predicting, exploring, describing, and understanding phenomena. The notion that quantitative and qualitative research approaches are not only compatible but also complementary underscores the necessity for ongoing research studies that employ mixed methods (Tashakkori & Teddlie, 2010). It fosters inclusivity, pluralism, and complementarity, encouraging researchers to adopt an eclectic approach to method selection and the conceptualization of research.

Table 10 Summary of Methods

Research stage	Method	Type of Data	Applications
1	**Secondary data**	**Business reports, business presentations**	Understanding the principles of digitaltransformation and the state of the fashion context.
1	**In-depth interviews**	**First round** Interviews of 15 sales and marketing professionals (15 hours). **Second round** Interviews of 10 sales and marketing professionals (10 hours).	Gaining how SMEs operating in fashion are approaching digital transformation and how COVID-19 has influenced it. A deeper analysis of the fashion context, trying to understand the barriers and the main drivers of digitalization for SMEs.
2	**Survey**	**Online Survey** An online survey of marketing, sales professionals, entrepreneurs, CEOs, owners, and consultants from SMEs. Sample n=207 respondents.	Identification of different approaches to digitalization in the fashion context.

3.1. The Qualitative Phase

25 semi-structured in-depth interviews were conducted with senior executives, managers, and professionals from the fashion industry who operate in SMEs. The profile of that sample is presented in Table 11. The objectives of this phase were to identify the expectations and the barriers regarding digital transformation and the adoption of new technologies, as well as understanding the drivers that lead SMEs to approach techno-mediated processes and the effects of the Covid-19 pandemic. It has been used purposeful sampling to recruit the participants, based on their knowledge and expertise in the fashion industry and digitalization processes.

The interviews were conducted using the Zoom platform and fully considering that COVID-19 limited the possibility of carrying out in-person activities. All the professionals were asked to keep their cameras and microphones on during all stages of the interview. One week before the interview, each interviewee was informed about the main topics that would be discussed. The interview protocol was elaborated by taking into consideration a preliminary literature review and the analysis of business cases. The questions were open-ended or semi-structured, and they mainly regarded the

structural changes happening in the fashion sector, the influence of the digital transformation of SMEs, the effects of the Covid-19 Pandemic on firms, the main technologies implemented, and the areas of investment in the near future.

The interviews lasted for one hour and were recorded and transcribed by the authors. The interviewees were contacted a second time to verify the reliability and completeness of their comments. At the end of the research, a report was sent to all the professionals who participated along with all the main findings of this study. The evidence derived from the interviews was enriched by information collected during their participation in two online seminars on the issue of digitalization of the fashion sector. More than 30 industry professionals took part in these seminars, including CEOs and company managers, who contributed, through their experience and by identifying the main dimensions of the digital transformation process in the fashion industry.

For the data analysis, a theories-in-use approach was applied, which permitted exploiting the experiences and knowledge of fashion industry experts and professionals to extract valuable constructs that reflected the drivers behind digitalization (Zeithaml et al., 2020). The analysis of the interviews was conducted with the aim of generating dimensions and finding common topics among all the empirical material that was obtained (Yin, 1989; Eisenhart, 1988). Interview transcripts were analyzed by using a manual coding procedure to map the general state of the fashion industry with reference to the research questions. Manual coding facilitated the process and let it rise to more conceptual and theoretical levels of analysis (Saldaña, 2021). This process permitted to examine this industry as a whole and gain a holistic vision of the phenomenon that integrates heterogeneous and variable approaches.

Table 11 Sample profile: Qualitative study

Sample profile: Qualitative study

#	Job Position	Gender	Seniority (in years)	Sector
1	Sales Executive	Male	5	Clothing
2	CEO	Male	20	Clothing and footwear
3	Communication Specialist	Female	9	Clothing
4	Commercial Director	Male	6	Footwear
5	CEO	Male	15	Clothing and accessories
6	CEO	Male	28	Clothing
7	Marketing Strategist	Male	15	Clothing and accessories
8	Marketing Director	Female	15	Clothing
9	Marketing executive	Female	15	Clothing

10	Retail Buyer	Male	5	Clothing, Footwear and Accessories
11	Product Specialist	Male	30	Clothing and accessories
12	Marketing Director	Female	15	Clothing
13	Communication Director	Male	9	Clothing, Footwear and Accessories
14	CEO	Female	15	Clothing and accessories
15	CEO	Male	20	Clothing and accessories
16	Marketing Manager	Female	8	Clothing
17	Sales Director	Female	16	Footwear
18	Sales Director	Female	6	Clothing, Footwear and Accessories
19	Marketing Director	Male	10	Clothing and accessories
20	Communication Director	Maler	15	Clothing
21	Sales Director	Female	28	Clothing and accessories
22	Sales Director	Female	20	Clothing
23	Key Account Manager	Female	12	Clothing and accessories
24	Marketing Director	Female	12	Clothing
25	Sales Director	Male	9	Clothing, Footwear and Accessories

3.2 The Quantitative Phase

Based on the results derived from the qualitative phase, it was developed a questionnaire aimed at exploring different approaches to digital transformation. The questionnaire was created by combining the results of the qualitative phase with key studies from the scientific and managerial literature on the digitalization of the fashion sector. It was conducted an *ad hoc* segmentation analysis with no prior information that related to the obtained segments and hypothesized that SMEs operating in the fashion industry differ in terms of their approaches to digital transformation.

The objectives of this phase included measuring the level of digitalization of the fashion industry on a large scale; analyzing common challenges involved in the digital innovation processes; and identifying clusters of similar companies in terms of digital needs and desired benefits.

The online questionnaire was administered to senior executives and managers of SMEs who were operating in the fashion industry. Participants were recruited through a panel provider who specialized in recruiting B2B respondents. A final sample of 207 respondents was obtained. From a corporate point of view, the majority of the B2B companies interviewed operate in the clothing sector (71%), followed by the accessories sector (25%), then the footwear sector (20%), leather goods and tanning (13%) and finally goldsmith's work (10%). Furthermore the 44% of the sample operates in both B2C and B2B markets, while 34% are active only in B2B markets.

3.3 The Segmentation Model and Its Measures

To understand the different approaches to digitalization, this study applied a segmentation analysis based on seven variables (1) digital orientation, (2) digital capabilities, (3) tendency to exploit existing knowledge, (4) attitude to explore and experiment, (5) degree of integration (6) social media applications, and (7) artificial intelligence and big data analytics usage. Table 12 presents an overview of the scales and the items used to measure each construct and the results of a confirmatory factor analysis (CFA) including both construct reliability and validity.

The identified segments of the companies were then profiled with reference to their degree of use of digital systems, the main challenges they faced, their level of satisfaction, future investments, as well as company size, turnover trend, sector, strategic orientation, and type of market (B2B vs. B2C).

3.4 Data Analysis

Prior to the segmentation analysis, confirmatory factor analysis (CFA) was applied to assess the validity and reliability of multi-item scale measures that were used as covariates in the segmentation model (see Table 1). CFA showed an acceptable fit (χ2/df 5 1.82; CFI=.885; SRMR=.064), and the variables displayed an appropriate level of reliability and validity with composite reliability coefficients larger than 0.70, an average variance extracted (AVE) larger than 0.50, and correlations between the latent variables lower than the AVE square roots (Hair et al., 2010). The items were averaged for each variable to obtain composite scores.

A segmentation analysis was carried out via latent class analysis (LCA) using Latent GOLD® 5.1 software (Vermunt & Magidson, 2013). The authors used the Bayesian Information Criterion (BIC) to compare the relative model fit and verify the preferred solution in connection with the Akaike information criterion to determine the optimal model (Collins and Lanza, 2010; Vermunt and Magidson, 2013). That analysis led to a four-cluster solution, and the different profiles were then assessed in terms of over-extraction, class separation, and interpretability of results (Collins and Lanza, 2010). The solution provided showed no evidence of over-extraction with the smallest cluster, including 20% of the sample, guaranteeing a correct and deep interpretation thanks to stronger class separation.

4. Findings

4.1 The Drivers of Digitalization in Fashion

The qualitative analysis defined 7 variables as drivers in the digital transformation processes of SMEs operating in the fashion industry in detail: Digital orientation, digital capabilities, exploitation of existing knowledge, exploration and experimentation, social media usage, AI & big data analytics, and integration.

- **Digital Orientation**

This variable concerns the definition of a clear digitalization strategy to introduce new technologies to improve business processes and offer innovative products and services. SMEs operating in the fashion context seem, in most cases, to lack a long-term strategy in terms of digital transformation. For these particular companies, implementing techno-mediated approaches is still an opportunistic choice linked to the moment to solve sudden problems for contingent needs. These companies do not yet clearly perceive the value that technology generates in terms of production and the organizational or relational processes undertaken with customers and stakeholders.

> *"Our digital interest and orientation are not very high; there are no underlying strategies or investments in the long term; we simply decide to adopt new tools when we have urgent needs, as in the case of COVID-19, when we have foreseen an e-commerce"* (CEO of clothing company).

This medium level of digital orientation mainly derives from cultural biases, such as the idea that fashion is connected to craftsmanship and technology causes the depersonalization of items.
Further, in many SMEs, especially in family business companies, the founders and original entrepreneurs still will keep their managerial positions and are thus tied to old business schemes where digitalization is considered to be a subsidiary factor to invest in only if necessary; this view underscores how in the sector, there is a lack of generational turnover that can innovate business culture. There still remains classic approach where major operational choices are taken unilaterally by CEO or owners and based on old logic that very often does not take into account the needs of customers and the mutability of today's market.

> *"As a marketing director, I am always interested in the latest innovations in the field of digitalization; unfortunately, the C-level figures of our firm, that are still the company founders, seem not to understand the urgency and necessity of bringing innovation to operational processes "(*Marketing director, Clothing and footwear company).

- **Digital Capabilities**

Among the SMEs operating in the fashion context, the level of digital competencies is limited. Consequently, firms tend to use less complex and innovative systems, such as websites or e-commerce, thereby requiring further training to develop more advanced approaches and highlighting a need for more education. This factor depends mostly on the lack of specialized human resources involved in the digital processes who know how to enhance the potential that technology provides. It is also a financial issue since buying advanced tools or hiring *ad hoc* professionals and setting up IT departments initially does involve high tangible costs.

> *"We know that there are proficient digital tools that could improve our business, but we still do not have the resources or a high level of digital culture or competencies to invest in them; we limit ourselves to websites, e-commerce, or platforms for order management"* (CEO, clothing and accessories company).

This lack of skills and trained staff lead these companies to not perceive the possibilities that technology provides in the increase in turnover or in terms of cross-selling. They have not yet realized how the correct use of digital can enhance the volume of sales, build customer loyalty, and propose new solutions that are well designed according to the needs and requests of their clients.

> *"We are aware that there are devices able to profile customers and automatically provide customized solutions and items, but we don't have people able to exploit these technologies, and we currently have no plans to invest in them. In this phase of uncertainty due to Covid-19, we prefer not to risk or use too many resources "* (Commercial director, clothing company).

- **Social Media Usage**

The use of social media is growing strongly in the fashion sector. It should be noted, however, that despite the fact that the adoption of sophisticated tools is low, investments in certain types of technologies, such as social media, have grown, especially during the COVID-19 pandemic. This change is occurring because those channels have positive implications for customer relations, allow direct and immediate interaction with stakeholders, and create a continuous exchange of information and data.

> *"Social media are very efficient ways to make yourself known and reach a large audience of people without having to incur very high costs. We mainly use Facebook and Instagram to interact with our customers"* (Marketing director, clothing and footwear company).

However, it should also be highlighted that SMEs, in many cases, do not exploit most of the potential of social media and instead use these channels as simple showcases to sell their products, as online sales platforms or virtual marketplaces alternatives to physical stores, e-commerce, and a website. They still fail to fully understand the relational logic in these tools or the possibilities of using them to develop co-creation value processes with their customers.

> *"We have implemented social media exclusively to enrich our sales channels. It is almost an alternative marketplace where we publish the most interesting items of the collection and propose them to our users. We have a strong return on sales. However, we do not have the resources and the suitable staff to use social networks to interact with customers and create ad hoc content as do the big brands. For us, it is just a digital showcase" (*CEO, clothing company).

For small businesses, there is currently a lack of structured use of social media; more investments are needed to create more innovative content that is not linked only to the sale of a product. They are not seen as vehicles for creating ongoing relationships with customers, but only as simple tools to increase visibility or sales. In most cases, these companies still need personnel who know how to manage these channels more organically from a relationship perspective.

- **AI & Big Data Analytics**

The level of implementation of Artificial Intelligence and Big Data Analytics by SMEs operating in fashions is still low. The use of big data analytics is still marginal, and the investment in artificial intelligence and chatbots is still limited. In small and medium-sized enterprises, there is almost no interest in adopting data-driven solutions, it is not just an economic, and, above all, cultural matter; business owners do not comprehend the benefits of using software that is capable of collecting, systematizing, and processing insights but instead are anchored to more classic business logic.

> *"We have not implemented software that allows you to manage data digitally, we are still tied to old dynamics; we collect information personally, and we upload them to our platforms or the various Excel sheets, but we do not base all our business choices on that data"* (Sales director, clothing and accessories' company).

In SMEs, data management is still physical through the compilation of Excel sheets or property platforms that consequently entail not only a greater work burden but also more confusing and less punctual management of information. Moreover, these companies do not even understand the potential of artificial intelligence in predictive terms for their business activities; doing so would

guarantee more immediate tangible results, allowing them to monitor market trends, consumer preferences, and thus better guide their business choices.

- **Exploitation of Existing Knowledge**

This concept refers to the tendency to exploit internal and external existing knowledge to improve business processes, increase efficiency and better satisfy customers' needs.
SMEs, despite having shortcomings in terms of technological literacy, tend to exploit the knowledge already existing in the company to generate efficiencies in its operations, coordination, and enhance the quality of its business relationships. Exogenous factors, such as the complexities due to the pandemic seem to push the SMEs operating in the fashion world to make use of the knowledge already owned to face sudden changes in the business scenario and innovate business processes.

> *"We are aware of our limits in terms of the use of technology, but to cope with the difficulties arising from the Covid 19 emergency, we have tried to make the most of the knowledge we already had in the company and to learn as much as possible from the ecosystem of companies with which we relate. For example, we have developed forms of online sales in real-time by exploiting social media or platforms we have been using for years and that we master at best* (CEO, accessories company).

- **Exploration and Experimentation**

These refers to the tendency to constantly search for new technological solutions by experimenting with new approaches and processes and seeking creative ways to satisfy customer needs.
It is interesting to note that the majority of SMEs operating in fashion are interested in exploring and experimenting with digital devices to innovate their business practices from a techno-mediated perspective.

> *"Although we have not adopted complex technologies to date, mainly for budgetary reasons, exploring new possibilities is fundamental for us. We participate in sector fairs, and we analyze what competitors are doing. Moreover, with the instruments we already have, we try to exploit them in innovative ways "*(Marketing director, clothing, footwear and accessories' company).

However, despite this clear interest in experimenting with new digital technologies, these firms need more support for the knowledge, selection, and implementation of these solutions to fully understand the opportunities present and the value generated.

- **Integration**

In the fashion sector, attention is given to having greater integration between functions, such as marketing, sales, and customer service and improvement of shared reporting across departments, which is also a central topic. It is no longer possible to think in terms of silos or closed compartments. Companies need to move into open ecosystems wherein coordination and interconnection between functions are of primary importance.

Moreover, the omnichannel approaches that now considered central in today's market are complex to manage if the aforementioned approach to integrating functions and data is still missing. Consumers often move continuously on different touch points, both physical and digital, requiring companies to have an approach that is interconnected not only between marketing and sales, but also between customer care, retail, and logistics.

> *"We realize how many sources of information exist; data internal and external to the company must be organized in order to extract correct insights. In addition, there are now many touch points with customers, it is necessary to monitor them all"* (CEO clothing company).

This view is supported by technologies that can promote data sharing and integration, including CRM, which can enhance the coordination of information that flows among departments and even with players from the external ecosystem. The role of CRM is still marginal in the SMEs in fashion, and the tools used are too often unable to collect data from multiple sources and is a strong minus for small and medium firms that now live in open ecosystems where there are numerous physical and digital touchpoints with customers. It is, therefore, necessary to use CRMs that are able to intercept this data and provide better-performing insights and strategies.

These companies are also not able to integrate CRM with other tools or platforms already in use, so they do not fully exploit the potential of these devices. They fear that the connection of CRM systems to other technological solutions may cause the loss of data collected over the years through other platforms already in use. It is, therefore, necessary that they better understand that these systems work with a view toward integrating information being derived from heterogeneous sources.

> *"We have a CRM, but we use it little, among other things, it is not very advanced. We don't understand all the features well. We prefer to keep the internal platforms already in use rather than use more advanced CRMs or integrate them with our databases, the risk would be to lose data already accumulated over time"* (Marketing director, clothing company).

Table 12 Confirmatory factor analysis and construct reliability and validity

Scale items	Factor Load-ings
Digital orientation; AVE= .721; Construct reliability= .928	.781
Our company has developed a clear digitalization strategy	.921
The quality of our digital solutions is superior compared to our competitors'	.928
The features of our digital systems are superior compared to our competitors'	.797
Some of our digital solutions are new or have just been launch on the market	.808
Exploration; Adapted from Lubatkin *et al*. (2006); AVE= .730; Construct reliability= .917	
Our company looks for novel technological ideas by thinking outside the box	.866
Our company bases its success on its ability to explore new technologies.	.871
Our company creates products or services that are innovative to the firm	.867
Our company looks for creative ways to satisfy its customers' needs	.793
Our company actively targets new customer groups	.748
Exploitation; Adapted from Lubatkin *et al*. (2006); AVE= .733; Construct reliability= .906	
Our company commits to improve quality and lower cost	.780
Our company continuously improves the reliability of its products and services	.801
Our company increases the levels of automation in its operations	.704
Our company constantly surveys existing customers' satisfaction	.810
Our company fine-tunes what it offers to keep its current customers satisfied	.854
Our company penetrates more deeply into its existing customer base.	.759
Digital Capabilities; AVE= .783; Construct reliability= .948	
Acquisition of relevant digital technologies	.875
Identification of new opportunities in digital	.864
Properly answering to digital transformation	.906
Mastering cutting-edge digital technologies	.882
Developing innovative product/services/processes using digital technologies	.898
Integration; AVE= .813; Construct reliability= .869	
Our company has a dedicated network to share information with our main clients	.866
Our internal and external sources of information are integrated and connected in real time	.827
Our ordering system is integrated between the online and offline channels	.852
We have integrated selling strategies across the online and the offline channels	.759
Artificial Intelligence and Big Data applications; AVE= .815; Construct reliability= .864	
We use chatbots to interact with our clients	.767
We are investing in artificial intelligence systems	.844
We use big data analytics to predict future scenarios	.858
Social Media applications; AVE= .839; Construct reliability= 912	
We increasingly use social media to identify new business opportunities	.864
Social media usage has improved the quality of the relationships with our clients	.965

All variables are measured on a 7-point Likert scale.

4.2 Different Approaches to Digitalization in Fashion

In the fashion context, the approach of SMEs to digitalization differs in terms of digital orientation and capabilities, the tendency to exploit existing knowledge, the attitude to explore and experiment, the degree of integration across departments, and the application of digital tools like social media, artificial intelligence and big data analytics. Through segmentation analysis, our study identified four different clusters of SMEs operating in fashion, the *Cautious Explorers* (35% of the sample), the *Unawares* (24%), the *Novices* (21%) and the *Digital Champions* (20%). A summary of these segmentation model parameters and covariates is presented in Table 4.

The Cautious Explorers. The cautious explorers represent 35% of the sample. 43% of these companies operate in both B2B and B2C markets, and 30% offer in addition to products also services that complement their offers. These are medium-sized companies located mainly in the textile, clothing, and accessories sector.

This segment holds a medium orientation toward digitalization and a good level of digital skills. They are open to experimenting with and integrating new knowledge rather than simply continuing to use the existing one. They are satisfied with the solutions that are currently available, even when the use of new technologies, such as social media, or more complex tools, such as artificial intelligence and big data analytics, is limited.

The cautious explorers use digital systems mainly to manage their relationships with customers, but also to promote products (69%), retain customers (65%), offer after-sales services (62), or to improve production processes (61%). The decisions in terms of implementing technology are made by c-level figures, with 43% of those decisions made by the CEO. As a consequence, the role of the IT director in purchasing decisions is limited.

In the future, this segment intends to invest in more advanced areas, including business intelligence (56%), improved reporting (47%), promotion of cross-selling actions (47%), and providing more accurate monitoring of multi-channel activities (46 %). Ease of use and implementation along with integration with the systems already in use and the level of technical support are the most important purchase drivers of technology for this segment. What is holding back these companies from approaching more advanced digital processes is the corporate culture, the greater complexity of the most advanced tools, and budget limitations.

The Unawares Group. The Unawares segment represents 24% of the sample. Almost all these companies operate in B2B markets with a strategy oriented to their product. These are small and medium-sized companies that operate mainly in the textile, clothing, and accessories sector. This is also the segment with the lowest level of orientation toward digitalization and with limited skills in digital technologies. In fact, the companies in this cluster use few basic tools, but at the same time declare they are not satisfied with them. Their use of new technologies, such as social media, artificial intelligence, and big data analytics is marginal and, in most cases, actually non-existent.

The Unawares group uses technology much less than other clusters and does so mainly to promote their products (47%), trying to stimulate demand (35%), and retain customers (41%), and only to a limited extent to optimize production (43 %). These companies have no interest in experimenting and have significant difficulties when using the existing knowledge in their companies to improve overall business processes. Their main limitations in undertaking more advanced digital approaches are budget, the corporate culture, and limited skills of their human resources in departments. It seems they have a clear lack of professionals who are capable of perceiving the value that technology can bring to their businesses.

In the future, they do intend to invest in business intelligence (55%), improve the customer experience (55%), apply segmentation and analysis of consumer behavior (53%), personalize communication actions (47%), and monitor multi-channel activities (47%). Among the drivers for purchasing digital devices are their ease of use and implementation as well as the cost, which are fundamental variables for this particular segment.

It is always the c-level or business owners who make the key decisions to implement technology, as they are the personnel who manage the financial part of the companies. Their IT Directors only play a marginal role.

The Novices. Novices represent 21% of the sample. These are companies that act mainly in the textile and clothing, footwear, and accessories sectors. The majority operate in both B2B and B2C markets and have a diversified, competitive strategy that is both product and service-oriented. This segment has a medium to low orientation toward digitalization and only moderate digital skills. They tend to experiment with new technologies, particularly those related to artificial intelligence and big data analytics, while their use of social media is more limited.

They are less likely to experiment in digital matters compared to the Cautious Explorers, as they have only recently approached this space (M = 4.4) and still need to implement effective systems to exploit the existing knowledge (M = 3.9) to improve their business processes and increase the level of integration between their departments (4.2).

They are satisfied with the tools already in use, and their main barriers to digitalization are budget limitations (48%), internal organizational problems (48%), limited technical skills and competent human capital (45%). They use technology to promote their products (60%), stimulate demand (52%), build customer loyalty (55%), and deliver after-sales service (60%).

When they decide to implement new tools, they research the technical support, ease of use, and the integration with existing platforms. In the future, they intend to invest in solutions to customize promotions (64%) and communication (50%), improve segmentation and analysis of customer behavior (50%) and increase overall business efficiency (50%).

Compared to the first three clusters, in these particular companies, the IT director has decision-making power for the purchase of technology (40%). This circumstance highlights a possible problem related to having excessive technicality in the selection of digital tools with respect to the assessment of its benefits for the company functions that will implement them.

The Digital Champions. The Digital Champions represented 20% of the sample. 42% of these companies act in both B2B and B2C markets, and 40% have a fully product-oriented competitive strategy. These are medium-large companies operating mainly in the textile and clothing, footwear, and accessories sectors. It is the cluster with the highest level of digitalization orientation as characterized by a well-defined long-term strategy and advanced skills.

Although they are very satisfied with the tools available in their company, they do not limit themselves to what is already in use, but rather continuously experiment and explore new technologies, including artificial intelligence, big data analytics, and social media.

These companies adopt technologies primarily to promote products (90%), retain customers (90%), improve the customer experience (88%), and optimize production (80%). Among the main barriers to digitalization are the dynamics of the evolving market (50%), problems related to the integration of new solutions with existing platforms (38%), and the corporate culture (33%), albeit to a lesser extent than in the other clusters.

The c-levels or the owners of the companies handle implementing the new technology, and the role of the IT director is marginal. The purchase drivers of these tools certainly include ease of use, the level of technical support, cost, and integration with existing platforms. In the future, they intend to invest in solutions to increase business efficiency (35%), generate new insights and gain business intelligence (28%), monitor multi-channel activities (25%), align departments (25%) and communicate in a more personalized way (25%).

Table 13 Segmentation Model Parameters and Covariates

	The Cautious Explorers	*The Unawares*	*The Novices*	*The Digital Champions*
Cluster Size	35%	24%	21%	20%
SEGMENTATION MODEL VARIABLES				
Digital orientation	4.7	2.6	3.8	5.8
Exploration	5.7	3.6	4.4	6.7
Exploitation	5.1	3.7	3.9	5.9
Digital Capabilities	5.1	3.1	4.4	6.3
Integration	5.0	2.7	4.2	6.6
Artificial Intelligence and Big Data	4.3	2.0	3.8	5.9
Social media applications	4.7	2.8	3.9	5.8
COVARIATES				
Business market type				
Mainly B2B	37%	51%	8%	35%
Mainly B2C	20%	13%	33%	23%
B2B and B2C	43%	36%	60%	42%
Servitization				
Completely product-oriented	42%	54%	39%	40%
Mainly product-oriented but offering some services	25%	24%	28%	29%
Both product-oriented and service-oriented	30%	18%	25%	25%
Mainly service-oriented but offering some products	1%	0%	2%	2%
Completely service-oriented	1%	4%	5%	5%
Satisfaction with current digital solutions	5.2	3.3	4.3	6.3
Number of employees				
Less than 10	22%	30%	19%	16%
10 – 50	15%	16%	17%	12%
51 – 250	30%	29%	15%	27%
More than 250	33%	26%	49%	44%
Turnover				
Up to 2M Euros	35%	41%	19%	21%
2M – 10M Euros	16%	10%	20%	20%
10M – 50M Euros	20%	29%	22%	22%
> 50M Euros	29%	20%	40%	37%
Turnover variation over the past 12 months				
Increased more than 5%	17%	27%	11%	32%
Increased between 1% and 5%	16%	14%	21%	49%
Unchanged	26%	14%	16%	10%
Decreased between 1% and 5%	8%	6%	19%	7%
Decreased more than 5%	24%	32%	29%	0%
I do not know	8%	8%	5%	2%

5. Discussion

Today the fashion sector is undergoing profound changes due to internal factors, such as the acceleration of digital transformation processes, but also external factors, such as the consequences of the

Covid-19 emergency that have posed complex challenges for the entire business panorama (McKinsey, 2021). Digitalization and business transformation are among the most complex challenges that fashion firms are now facing (Bettiol et al., 2022).

As pointed out in the literature, it is necessary to specify that fashion companies are experiencing digital transformation at different levels and speeds (Cabigiosu, 2020). There is a strong dichotomy between large companies that have already implemented advanced techno-mediated solutions and small and medium-sized enterprises that are still struggling to perceive the value that technology generates.

Given the centrality of this topic, this study intended to analyze the fashion sector with particular reference to the category of SMEs, examine the main barriers and dimensions in approaching digital transformation processes, and identify different clusters of companies based on the needs and benefits researched and the information gathered.

In primis, therefore, this research systematizes the driving factors that lead SMEs operating in fashion to approach digitalization, taking into account not only the technology itself, but by taking a holistic view, the entire ecosystem in which these companies operate.

Through an in-depth analysis of the reference literature, different sector reports and the development of a qualitative analysis phase based on 25 interviews with sector professionals, 7 key dimensions that influence the digital transformation processes of companies in the sector were identified, which respectively are: digital orientation, digital capabilities, exploitation of existing knowledge, exploration and experimentation, social media usage, AI & big data analytics, and successful integration.

Digital orientation and digital skills represent the central dimensions for approaching digital transformation; these firms need to develop clear long-term strategies for the implementation of technology and thus require human resources with structured skills to exploit the potential of digital tools and thereby generate value across the entire company (Kindermann et al., 2021).

Although SMEs operating in fashion still have limited skills and a low level of digital literacy in most cases, they have demonstrated an attitude toward exploiting the already existing knowledge and finding creative ways to satisfy the needs of customers. Furthermore, most of those firms show a strong interest in experimenting even if they often do not have the tools or adequate competencies to develop techno-mediated processes currently.

In this regard, the attention to more advanced devices and software is growing. Social Media are becoming essential channels being approached by SMEs in the fashion sector (Hisiao et al., 2020); the channels are used to develop deep and direct interactions with customers and generate a continuous exchange of data and information. However, small and medium enterprises still seem to exploit social media only in terms of sales and as a virtual marketplace that allows them to reach many users;

unfortunately, a more advanced perspective in relational terms is still missing for these firms in the adoption of online channels.

Further, the use of the most advanced technologies, including AI and Big Data analytics, is still rather limited; there seems to be a lack of interest in investing in these tools and, above all, in the professionals who are able to exploit them. However, SMEs are still aware of how these systems can guarantee multiple benefits, including constant and updated insights, customization of products and services offered, improvement of production, and organizational developments, such as the creation of agile and sustainable supply chains (Gonda et al., 2020). The complexity of using these systems and the high costs, however, still discourage these companies from integrating them fully into their operational processes.

Considering the previously mentioned drivers, this study highlights how within the same fashion sector, there are differences and also different approaches to digitalization. The four clusters that were identified represent diverse ways of interpreting the change that is underway and the required diversified strategic solutions needed to undertake the digital shift.

Basically, all the segments showed an average level of digital orientation and limited skills in the use of the emerging technology, especially for more complex tools, such as Ai and Big data analytics. Only the Digital Champions segment seemed to possess greater structured skills that allow them to exploit the potential that technology can generate. The cautious explorers and the novices, on the other hand, despite cultural barriers and economic limitations, still showed a strong interest in exploration and developing techno-mediated processes through innovative ways. To complete the analysis were the Unawares, which not only do not understand the value deriving from digital, but also have little interest in innovation and modifying existing business models.

Thus, this heterogeneous context, complicated by the effects of the Pandemic, requires customized guidelines for any SMEs operating in fashion that approaches digital transformation by considering their specificities and taking into account their needs, competencies, and budget possibilities. Given the more dynamic segments, such as Digital Champions and Cautious Explorers, there are new possibilities to proceed with more advanced techno-mediated solutions, while with the Unawares and the Novices, their primary need is technological education and comprehension of the value and the key benefits that are reachable through the use of digital solutions. More specific related insights are presented in the managerial implications section of this manuscript.

6. Conclusions

Digital transformation is profoundly changing the fashion sector with particular reference to the SMEs segment (Chakraborty et al., 2020). This process has recently been accelerated by the Covid-

19 emergency, which has further emphasized the limits and the need for more innovation in this sector (McKinsey, 2021). In fact, companies have found themselves unprepared to face such structural changes by having to deal with cultural limitations and barriers when approaching digitalization correctly and efficiently.

Based on empirical evidence, after analyzing the fashion industry with particular reference to SMEs, this study identifies the drivers of the current digitalization processes taking into account the substantial differences of this sector with other ones. This research also intends to map the state of the fashion system on a large scale that appears both heterogeneous and stratified with segments of companies having extremely different needs and peculiarities. Thus, through a quantitative segmentation analysis, four clusters of companies were identified that represent different approaches to digitalization.

This study fits into the recent debate in the literature on digital transformation and its acceleration due to the Covid-19 emergency and sheds light on the fashion system and in particular on the SMEs segment that appears to date still under-investigated (Gonda et al., 2020). However, the study does have some limitations. It is an analysis of a context that is still in profound evolution, especially due to the emergency and the exogenous factors still in progress that modify the reference landscape. Moreover, only SMEs operating in Italy were analyzed in order to gather a complete picture of the sector other players or categories of companies should also be taken into consideration to fully understand what the effects of digitalization on the fashion ecosystem are currently.

Future studies could, first of all, analyze the evolution of these identified clusters and their characteristics with reference to the continuous changes taking place. Accordingly, it would be necessary to verify the effectiveness of the strategic approaches in terms of digital transformation as provided to each cluster and the potential of the guidelines being provided.

7. Managerial Implications

This research has important and practical significance, as it provides customized guidelines to the 4 identified clusters for them to approach digital transformation efficiently. For cautious explorers, actions are needed to reassure this segment in the face of new technologies, given the cultural barriers that still exist. In particular, it is possible to guide these companies in their exploration of new tools and offer insights for the implementation of technologies in their business processes through trials and demonstration sessions. They need solutions that will take into account their specific needs and budget possibilities that are not too consistent. The cautious explorers are open to experimenting and innovating their business models through new digital tools, but they still need support in their knowledge, selection, and implementation of these solutions to fully understand the opportunities and the value that can be generated through their use.

For the Unawares, considering the low level of digital literacy, a strategy is proposed that focuses on training, even basic training, in the field of digital technologies. It will be necessary to propose *ad hoc* solutions, both intuitive and simple that take into account the limited budget constraints of these companies. It is important also to notice that they do not approach technology easily as they do not fully understand its usefulness and the benefits it can bring in terms of profitability.

The third cluster, the Novices, needs training aimed at understanding the value that digital solutions can provide. Compared to the previous segment, they have a greater interest in techno-mediated processes, in experimenting even if they own little culture, and having limited budgets to implement it. To date, the Novices do take advantage of technology, especially in the sales phase, but it is necessary to educate them on the more structured and integrated use of digital in the various business processes. They need support to understand the strategic use of the most advanced technological solutions, such as Artificial intelligence and Big Data Analytics, and how to integrate those tools with the systems already present in their companies.

The Digital Champions are the cluster that uses the most advanced digital solutions, so they represent an opportunity to study and identify best practices and guidelines. They are looking for solutions that allow them to respond effectively to sudden changes in the markets in which they operate and ones that can be integrated seamlessly with the systems already in use. Through an in-depth analysis of business models and ongoing dialogues with these companies, it will be possible to identify the strengths that the other categories of SMEs can then also exploit in their business activities. By utilizing the Digital Champions, it will be possible to open a more advanced overall dialogue on digital technologies and experiment with innovative solutions in other companies.

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Main Findings of the Thesis and Discussion

The study of digital transformation in the fashion sector, taking into consideration the SME sector and business-to-business context in Italy, presents numerous theoretical and practical outcomes, as it allows companies to improve relational approaches and optimize operational processes as well as innovate and personalize digital services.

From the analysis of the data collected, relevant findings and conceptual frameworks emerge that are useful to understand the dynamics and the peculiarities of the digital transformation of the B2B sector with particular reference to the fashion industry.

From the first paper, it appears clear that COVID-19 has shed light on the fact that digitalization is leading to a profound change in the B2B sector and that digital transformation is not an isolated phenomenon but has led to rethinking relationships (Rangarajan et al., 2021). The consequences of the pandemic have highlighted the issue of how business activities and relationship-building processes should be reorganized, as well as how human and technology resources can be better integrated and coordinated (Sheth, 2020a); adopting digital innovation represents a matter of survival also in a post-pandemic reality (McKinsey, 2020 Report). In particular, the research demonstrates that the modern relational approach can no longer be considered apart from a digital environment; the challenge is how to maintain the relational bond when technology is involved.

The paper defines a conceptual framework that defines three main dimensions (Efficiency of the interaction, Coordination and Digital Trust) and seven sub-dimensions as drivers of relationship approaches mediated by technology in the B2B sector.

The first dimension is the “Efficiency of Interaction”; digital tools have facilitated more efficient communication and sales systems supporting customer and stakeholder relationships. Technology can empower the quality of the interactions, the effectiveness of the operations, and the value co-creation processes between different players in the ecosystem (Sklyar et al., 2019). Interactions are increasingly undertaken virtually, connecting B2B players even at a distance; video conference systems, social media, and digital platforms have established new forms of communication and have facilitated companies in cutting travel costs and the need for lengthy negotiations (Singh et al., 2022). The professionals understood how the use of traditional tools in business interaction delays economic processes, leading to a situation that is no longer acceptable with the pandemic emergency (and in the post-pandemic reality), which has drastically boosted business approaches and requires immediate responses. Digital platforms, CRM and SMAs have facilitated “new” negotiation forms through the machine automation of different operations, decreasing the time and capital used in repetitive tasks and improving the level of personalization of the interaction. In particular, automation systems facilitate business managers and their interactions, enabling the automatic research of prospective

customers and tracing their buyers' journey, decreasing the sales process by automatically sending the most relevant content, revitalizing dormant leads through e-mail campaigns, and shortening time by sharing only qualified contacts to the sales and marketing team (Chen et al., 2022). This approach requires the cooperation of technology, which can replace the human approach with mechanical activities (Mero et al., 2020), and human interventions result more strategically by defining the machine's strategy.

The second dimension that has been affected by the pandemic is "Coordination"; it concerns the alignment of all the interactions of B2B players operating in teams, and it has an internal and external essence. During a crisis, collaborating with multiple actors, partners, and stakeholders may be crucial to effectively managing the crisis. With multiple sources of data and interactions, there is a need for an established mechanism to digitally and synchronously approach and collaborate across a coordinated, decentralized, and modular architecture of information and knowledge-sharing system. Internal coordination addresses the need for firms to define a unique organization with groups that interact and work together more effectively (Hallikainen et al., 2020; Kotler & Armstrong, 2017). External coordination concerns the ecosystem of external players that compose the B2B market (Agnihotri et al., 2016; Marshall et al., 2012); in a business landscape where networking is central (Quinton & Wilson, 2016), creating relationships is necessary.

From the complexities due to the emergency, such as social distancing, internal reorganization, and remote working systems, the need to develop coordinated and efficient structures organized in small and agile departments to allow for more fluid interaction has become even more evident to avoid every form of misunderstanding with external partners. This is a continuously developing trend: companies, even the largest, are reorganizing themselves to eliminate heavy internal structures without precise top management figures to generate teams capable of communicating more quickly and generating more transparent decision-making processes. Technology represents a facilitator through CRM, real-time visualization systems, and dashboards to encourage alignment and joint management of relationships (Xue & Li, 2022).

The third dimension that has been affected by COVID-19 is "Digital Trust". Clients and stakeholders are more focused on the trusting and transparent relationship that they can build in a digitally mediated environment. Trust represents a primary factor in business relationships. The paper referred to as "digital trust" outlines that some proxies and clues of trust have changed when most relationships occur in a digital setting (Hofacker et al., 2020). For this reason, transparency and "information transparency" as the equal data exchange between players are necessary. It is key to maintain clarity during the relationship, researching an equal integration of information, where all conditions are made explicit, and there is no room for subjective interpretation of clauses and requests. For this reason,

B2B players are also improving the use of tools such as blockchain or agile forms of negotiation such as smart contracts to carry on agile, dynamic customized agreements (Paul et al., 2022).

In the second paper, a particular sector, fashion, is analyzed with the main focus on SMEs. The fashion market is moving toward new service value offering logic based on a high level of customization flexibility (Adrodegari & Saccani, 2017; Ardolino et al., 2018), providing SMEs with the opportunity to improve their business models in a constantly evolving and changing market.

The second study starts from the basis of the first. The integration of digitalization with servitization triggers significant shifts in provider-customer interactions. A primary challenge for companies adopting digital servitization involves adapting and redefining prevailing product-centric relationships (Sjödin at al., 2020). This arises because digital services require providers to shoulder greater responsibility for the fundamental processes of the customer (Lerch & Gotsch, 2015), moving from transactional to relational engagements in a digital-mediated environment (Reim, Sjödin, & Parida, 2018). Consequently, digital servitization tends to cultivate closer provider-customer bonds characterized by co-creation logic, enduring commitment, and heightened investment in the relationship.

Furthermore, the digitalization of relational processes provides a fundamental substrate of information and interactions with customers, suppliers and other business partners. This data can be used to identify customer needs and opportunities to offer additional digital services that meet those needs.

The digitalization of relational processes enables in-depth analysis of customer information, allowing companies to personalize the offering of digital services based on the specific needs and preferences of each customer or category of customers. For example, a company using an advanced CRM system can collect and analyze customer data to identify opportunities to upsell or cross-sell additional digital services. Furthermore, digital channels and online platforms can be used to deliver these services in an efficient and scalable way. More in general, the digitalization of relational processes provides the foundation for the identification, personalization, and efficient delivery of digital services.

From the analysis, it emerges that the main dimensions affecting digital servitization models for SMEs are three: Digital Value Proposition, Smart Organization and Digital Ambidexterity.

The first driver, the “Digital Value Proposition”, is intended as the capacity of SMEs to improve and change the offerings with new service solutions through high exploitation of digital systems. It requires the ability of companies to gather and analyze data correctly to furnish personalized solutions for clusters of customers with everyday needs, requests, and consumption habits. Technology represents a central enabler in this process of co-creation of value (Bharadwaj et al., 2013; Matt et al., 2015) based on the continuous process of exchange of data between clients and companies; a

reciprocal and uninterrupted relationship that brings benefits to both (Buhalis, 2019). The first ones may exploit and take advantage of the customized services they need, and firms generally develop lasting and intimate relationships with multiple types of targets, enriching their client portfolio. AI and IoT are profoundly revolutionizing this approach through their capacity to gather, store, and analyze unstructured information, automate consumer segmentation at scale, and provide real-time analysis and predictive consumer trends (Li et al., 2021).

Secondly, digital servitization models require profound changes in the organizational structure, both internally and externally. Hence the relevance of the second dimension of the model, "Smart Organization". Digital servitization approaches require new internal architectures and modalities where technology (such as interconnected supply chains) creates non-physical infrastructures, leading to more significant coordination and efficiency (Guo et al., 2020). Companies are moving towards collaborative partnership approaches within the entire ecosystem; visual platforms are increasing the level of alignment, facilitating decision-making, and managing processes more quickly.

The third driver refers to the “Digital Ambidexterity” as the continuous interaction between the exploitation of processes, models, and knowledge already used and the exploration of new approaches and digital solutions that are different and more advanced than those already acquired. To efficiently propose digital service offerings, it appears key for SMEs the co-existence of established business processes and the rapid adoption of new value-creation activities enabled by digital mediated approaches (Chirumalla et al., 2023).

The third paper contains a broader-spectrum analysis; it moves from analyzing the phenomenon of digital servitization among SMEs to the analysis of the entire fashion industry. Seven key dimensions influencing fashion companies' digital transformation processes are identified: digital orientation, digital capabilities, exploitation of existing knowledge, exploration and experimentation, social media usage, AI and big data analytics, and integration. Those drivers are defined, taking into account not only the technology itself but, through a holistic perspective, analyzing the entire ecosystem in which these firms operate. Those drivers are summarized in Table 14.

Table 14 Key Dimensions of the digital transformation process in the fashion sector

Key Dimensions	**Definition**
Digital Orientation	Degree of definition of a clear digitalization strategy and constant commitment to implementing new digital technologies to improve business processes and offer innovative products and services
Digital Skills	Level of digital skills within the company and ability to respond appropriately to digital transformation
Social Media Usage	Degree of use of social media in business processes and positive impact on customer relationships

AI and big data analytics	Level of implementation of Artificial Intelligence and Big Data Analytics in business processes
Exploitation of existing knowledge	Tendency to leverage internal and external knowledge to improve business processes, increase efficiency and meet customer needs
Exploration and experimentation	Tendency to constantly seek new technological solutions by experimenting with new approaches and processes and seeking creative ways to satisfy customer needs
Integration	Level of integration of sales channels and internal and external information management

Furthermore, considering the previously mentioned drivers, this study outlines how, within the same fashion sector, there are different approaches to digitalization; four clusters (Unawere, Novices, Cautious Explorers and Digital Champions) have been identified to map the diverse ways of interpreting the transformation that is underway and which requires diversified strategic solutions to undertake the digital shift.

All the segments show an average level of digital orientation and skills and they are still limited in exploiting the technology (especially for more complex tools, such as AI and Big data analytics). On the one hand, there is the Digital Champions segment that can exploit the potential that technology can generate, and on the other, the Unawares that exhibit not only rudimentary skills but also little interest in innovation and the transformation of business models from a digital perspective. The Cautious Explorers and the Novices are positioned in the middle, who, despite cultural barriers and economic limitations, show an interest in exploration and developing digital-mediated processes through innovative ways that they have yet to acquire.

As specified before, in general, fashion firms, particularly SMEs, still demonstrate limited competencies and a low level of digital literacy; there are numerous challenges and structural barriers to adopting the digital shift (McKinsey, 2020). The first significant problem is undoubtedly the question of the budget that the digital solutions involve, considering that creating ad hoc systems or software involves very high initial costs, with a view to continued collaboration with software houses (Zahra et al., 2021). However, above all, it is mainly a cultural problem, considering that many companies are still anchored to the concept of fashion tied to craftsmanship and manufacturing; it is necessary to develop a new culture that integrates the craftsmanship character with new digital-mediated processes. Entrepreneurs in the sector need to understand that digital transformation does not mean depersonalizing the offer or the interactions with the customer but simply automating, simplifying, and accelerating processes to face a dynamic market. The cultural theme also derives from a matter of corporate organization; most of the C-levels and decision makers, especially of family-run companies, are still the old founders or owners, tied to old business models. In SMEs, in most cases, it is the business owner who chooses whether or not to adopt new tools and systems

(Zuhroh, et al., 2019; McKinsey, 2022). This leads to significant gaps given that, in many cases, these professionals do not fully understand the potential of these tools nor the needs of their employees due to a lack of digital culture.

For this reason, companies rarely invest or, in any case, need help finding professionals who can manage digital transformation processes. This is because they do not understand the potential and the value of training figures with digital and strategic skills integrated at an operational level. It is necessary to operate a profound transformation (that starts from the apical figures) and to include subjects who can integrate technology into current operating models and know how to strategically make decisions (Colombi, & D'Itria, 2023).

Despite the low level of digital competencies, SMEs show a growing attitude toward exploiting the existing knowledge and finding creative ways to satisfy customers' needs. They are interested in experimenting even if they often do not use the right tools or do not currently have adequate skills to develop techno-mediated processes (Chirumalla et al., 2023).

Finally, all the segments show that the adoption of the most advanced technologies, including AI and big data analytics, is really limited even if they are aware of how these systems can guarantee multiple benefits. This includes constant and updated data, customization of the offering, new forms of production, and organizational developments, such as the creation of agile and sustainable supply chains (Gonda et al., 2020). Firms need to develop clear long-term strategies to approach digital transformation and thus require human resources with structured skills to exploit the potential of new tools and generate value across the entire company (Kindermann et al., 2021).

Considering this heterogeneous context, complicated by the effects of the pandemic, customized guidelines for SMEs operating in a fashion that approaches digital transformation are necessary. They are provided in the paper by considering their specificities, needs, competencies, and budget possibilities.

Conclusion

COVID-19 has redefined how B2B organizations transform their business models, innovating production processes, re-organizing their internal and external structure, and giving a primary role to technology. From the theoretical perspective, first of all, this research project contributes to the recent discussion on digital transformation and its acceleration due to the emergency, which states that the pandemic has led to rethinking the way companies create and maintain business relationships, exchange and integrate resources (Rangarajan et al., 2021; Crick & Crick, 2020; Hartmann & Lussier, 2020). First, it analyzes the profound transformation the B2B sector is going through; it mainly sheds

light on the drivers of new relational approaches mediated by technology that have, up to now, remained ambiguous (Hadjikhani & Lindh, 2020). In this way, it also contributes to the debate on digital marketing and selling strategies in B2B, which are fundamental aspects of a relationship-based approach. It develops a bridge between the two areas that have become central post-COVID-19, having now the certainty that managing digital and physical interactions requires a higher integration between marketing and sales; those functions are now strictly interconnected, and it would be a mistake to consider them as parallel study streams or disconnected silos inside companies.

Secondly, the thesis project then brings fundamental theoretical advances in studies concerning the fashion sector and SMEs (Gonda et al., 2020). It highlights that the application of digital technologies in fashion is bringing about transformative and disruptive changes in the entire value chain, and these alterations are resulting in more innovative (faster, smarte, and more efficient) processes, offerings (products, services), and business models (BMs) (Bertola & Teunissen, 2018; Kalbaska & Cantoni, 2019). Among the most disruptive innovations is the spread of digital servitization solutions, which have increasingly grown in the last three years. Digital servitization as a sub-stream of servitization studies is at an early research stage (Paschou et al., 2017). There are many interpretations of the process of digital servitization; part of the academic literature (Skylar et al., 2019) considers technology as a tool for servitization scopes (Kindström et al., 2014). Other studies propose that technology is essential to the entire offering (Kohtamäki et al., 2019). Despite its widespread use in many industries, digital servitization is still a topic of extensive debate because its implementation is far from simple, and companies tend to struggle with it (Kohtam¨aki et al., 2019; Lerch & Gotsch, 2015; Schroeder & Kotlarsky, 2015; Tronvoll et al., 2020; Vendrell-Herrero et al., 2017)

For this reason, this study increases and contributes to broadening the sector's literature by providing new theoretical input and developing a model that start to shed the light to this process's central dimensions.

However, the project thesis does not limit itself to analyzing digital servization approaches but, through a holistic lens, intends to map the current state of the fashion industry in Italy on a large scale with particular reference to SMEs. The fashion industry appears heterogeneous and stratified, with clusters of companies with different needs and peculiarities (McKinsey, 2022). In particular, four segments are identified that represent different approaches to digitalization. Furthermore, the research recognizes the critical drivers of the digitalization processes in the fashion industry. Despite this is a central topic most of the studies have analyzed the implementation of digital technologies in large corporations (Cenamor et al., 2019) or innovative businesses (Ghezzi & Cavallo, 2020); however, specific studies focusing on SMEs operating in the fashion context are still relatively scarce (Gonda et al., 2020). This study focuses on SMEs contemplating the transformative changes caused by the

COVID-19 pandemic. This research enriches the digital transformation literature and fits into the discussion on the evolution of the fashion sector, thereby providing a rich context for further study of the impacts of the emergency on this particular industry (Casciani et al., 2022; Akhtar, 2022).

The thesis also has strong practical relevance; the first paper contributes to managerial practices, as the dimensions and subdimensions presented in the conceptual framework represent the central approaches to face the new interaction contexts. A clear understanding of the importance of such dimensions facilitates B2B managers in conducting a transformation more effectively, generating more systematic approaches in exploiting digital communication tools, improving the coordination of ecosystem relationships, and increasing trust in business negotiation; companies that do not evolve risk to expire in a few years (Soto-Acosta, 2020; Hartmann & Lussier, 2020; Cankurtaran & Beverland, 2020).

The second paper defines practical insights for fashion firms to embrace digital servitization; the conceptual model developed contains some of the main drivers to approach this process. In this sense, it has a solid empirical value for managers who desire to move towards the service offerings in digital environments (Kolagar et al., 2021). This research facilitates professionals to understand what organizational and operational processes, competencies, and knowledge should be implemented in maintaining and establishing digital services to obtain advantages, considering the pandemic's complications. It highlights the value derived from the exploitation of big data, AI, and IoT in customizing services for entire categories of customers, the potential of the visual dashboard, and CRM in favoring the creation of digital architectures inside the firms and providing insights and strategic approaches to managers to explore new business model connected to the service offerings (renting, reusing, recycling and so on).

Finally, the third paper, considering the four identified clusters, provides customized guidelines to SMEs operating in fashion to improve and correctly start digital transformation processes; it also identifies the relevant drivers for this shift. For each cluster, it is presented a personalized and strategic approach according to its characteristics and features. The Cautious Explorers and the Neophytes are open to exploring new tools and offering ideas for implementing digital technologies in business processes. They search for solutions that consider specific needs and budget possibilities that are not excessively large. They search for support in the knowledge, selection, and implementation of these systems to fully understand the opportunities and the value generated. The Unawares need to focus on primary education and awareness of digital tools. Those firms search for specific solutions, which are exceptionally intuitive and simple and meet these companies' limited budget constraints. They also have a low level of digital literacy and do not approach technology as they do not fully understand its usefulness. Finally, the Digital Champions already use advanced digital solutions, representing an

opportunity to identify best practices. They focus on cutting-edge technologies capable of responding effectively to the dynamics of the markets in which they operate and which integrate seamlessly with the systems already in use in the company. The digital champions are open to integrating more high-level systems and experimenting with innovative solutions.

Furthermore, on a practical level, this research also analyzes the main technologies capable of facilitating and enabling these digital transformation processes, such as social media, CRM, visual dashboard, AI, IoT, and Blockchain. The use of social media is growing strongly in the fashion sector (Mameli et al., 2021). Companies declare that they have intensified its use to identify new business opportunities and improve customer relations. Those tools facilitate establishing more solid and lasting customer relationships through advanced profiling, monitoring, and continuous assistance and support. All this takes company profitability, increasing sales, and value co-creation processes with end users (Shokouhyar et al., 2021).

The fashion business has gradually changed to a more social media and mobile-friendly environment. However, especially in smaller firms, there is still a lack of systemic use of these tools in a relational way, as there seem to be missing teams dedicated to communication able to exploit online channels to create an increasingly direct interaction with the final consumer, understand their needs, their expectations to establish a lasting relationship over time (Hsiao et al., 2020). SMEs in the fashion sector still perceive these channels as simple showcases for selling their products. They still fail to glimpse the relational logic in these tools or the potential for developing value co-creation processes with their customers. There is a lack of more structured use of social media; major investments are needed to create more innovative content (not just the so-called 'quick sale'), and it is necessary to hire personnel able to manage these channels more organically in a long-term relational perspective with the end customer (Rienda et al., 2021).

Another tool is CRM, which plays a role of primary importance as profiling, data collection, and real-time actions and allows the development of increasingly customized relationships. It is, therefore, necessary that operators in the fashion sector fully understand the benefits of acquiring tools such as CRM or Social CRM (it also integrates social media) which have the specific purpose of increasing the relational approach with their users (Sommella et al., 2023). The fact that this tool is little used represents a significant disadvantage for those companies, which now live in increasingly open ecosystems with numerous physical and digital touchpoints with customers. It is, therefore, important to use CRMs that can intercept this data to provide more performance insights and strategies. Those tools make it possible to coordinate departments, guarantee high levels of privacy, provide customized solutions to customers, and consequently improve the customer experience (Marolt et al., 2018).

Lastly, there is AI, which is able to analyze huge quantity of data, acquiring insights from various sources like social media platforms, blogs, or online web-sites (Baabdullah et al., 2021). In doing so, AI can analyze patterns between information and accurately predict trends. These functionalities of deep learning, machine learning facilitate fashion professionals in increasing customer experience, refining product design and development, optimizing service activities, and analyzing performances and KPI.

Furthermore, AI algorithms can accurately analyze historical data to predict demand, facilitating better inventory management; this decreases the level of overproduction, a significant problem in the fashion industry that contributes to environmental damage, improving sustainability (Mohammadi & Kalhor, 2021). Additionally, AI can also help in designing the architectures of the supply chain. For instance, AI systems can trace and analyze shipping data in real-time, ensuring that products are delivered most efficiently reducing time and carbon footprint (Jin & Shin, 2020). Despite the use of this advanced is still limited, by leveraging AI, the fashion industry is transforming into a proactive and predictive industry, searching for a more sustainable and consumer-centric identity (Luce, 2018).

Although technology has a central role in this research and it is deeply stressed, it emerges from all three papers that it is insufficient by itself; the so-called human touch is central to enabling these digital transformation processes and adopting advanced business approaches such as digital servitization (Sommella et al., 2023). Digital represents a facilitator but is never a substitute for human contribution; it constitutes a tool that enriches man's potential, increasing various capacities, such as physical power, the ability to retrieve data, to process information through analytics, to automate tasks, to facilitate organizational coordination and so on (Anie, 2021). Although the debate often focuses on the substitution effects of technologies, in most of cases, innovation will instead lead to an improvement of human and cognitive capabilities at work. In fact, technologies are implemented to support or enhance the tasks of operators, eliminating activities with little added value and time dispersion (McKinsey, 2020). In this way, professionals can focus on high-level activities, and their duties move from the manual sphere to the cognitive sphere, with significant improvement in the decision-making phases, organization, and design of processes and technologies.

Despite the progress made by advanced tools like Artificial Intelligence in recent years, human intelligence is still vastly superior; the ability to decode even very complex data and analyze a broader meaning, connecting very different heterogenous elements, remains a typical characteristic of the human being and requires qualities such as common sense, experience, emotional intelligence, empathy, intuition (Fenech et al., 2019). Without human capital there can be no digital evolution; it is therefore necessary to invest in the workforce and to face change, soft skills, teamwork, transversal skills, mental agility, and problem-solving are fundamental. Companies that want to take up the

challenge of digital innovation and remain competitive in the market must invest in their employees and select profiles capable of dealing with the actual transformation of the business scenario (Namiral, 2021). A question of leadership arises in fact, firms need figures who can prepare the ground within companies and make people understand the transition we are experiencing. Reinventing the structure and organization of work is fundamental in the post-pandemic setting; companies need to take the opportunity of the transformation to redesign their internal processes entirely and to combine the strengths of people and technology by creating an effective and efficient interaction between human and machine. Made these premises, it is clear that the value of people remains at the center of this paradigm and this digital shift. If human represents the fulcrum of this perspective, technology is not the end but only the means (KPMG, 2020).

Nevertheless, the studies conducted presents also some limitations. The first one is related to the fact that the three papers analyze mainly the Italian industrial scenario, which may cause a lack of generalizability of the results; notwithstanding, the Italian companies chosen for the analysis operates also internationally or have a solid multinational vision of conducting business deals and building relationships abroad. It could be interesting to analyze the digital innovation processes and fashion sector also in other countries or markets to have a broader perspective of the phenomenon.
Furthermore, the analysis considers a context that is still in profound evolution, especially due to the post-Covid-19 consequences and the exogenous factors still in progress that modify the reference landscape.
Future studies could deepen the evolution of the fashion sector when the effects of the Pandemic and other accelerators will be settled. Accordingly, it would be necessary to verify the evolution of the four clusters identified, the effectiveness of the strategic approaches in terms of digital transformation and the potential of the guidelines being provided.

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APPENDIX A

ONLINE QUESTIONNAIRE

Introduction

☐ I give my consent to participate in this research
☐ I do not give my consent to participate in this research [SCREEN OUT]

Screening

Q1. In which company function do you currently work?
☐ President/ Vice President/ Member of the Board of Directors
☐ CEO/Legal representative
☐ Entrepreneur/Business owner
☐ General management
☐ Commercial management
☐ Sales function
☐ Marketing function
☐ Communication-Media-Advertising function
☐ Human Resources [SCREEN OUT]
☐ IT
☐ Logistics
☐ Production
☐ Other (Please specify) _____

Professional Profiling

Q2. What is the title of your position/job title?

Q3. How long have you been working in this position?
☐ Less than 1 year
☐ 1-3 years
☐ 3-5 years
☐ 5-7 years
☐ More than 7 years

Company Profiling
Q4. How would you define the company you work for
☐ Mainly B2B
☐ Mainly B2C
☐ Both B2B and B2C

Q5. The company you work for operates in the sector (Please select one or more sectors)
☐ Textiles and clothing
☐ Footwear
☐ Goldsmithing
☐ Leather goods
☐ Accessories
☐ None of these [SCREEN OUT]

Q6. How would you define the company you work for
☐ Completely product-oriented
☐ Mainly product-oriented but offering some services
☐ Both product-oriented and service-oriented
☐ Mainly service-oriented but offering some products
☐ Completely service-oriented

Q7. The company you work for deals with (Please select one or more activities)
☐ Production
☐ Wholesale distribution
☐ Distribution to end customers (retail)
☐ Provision of services
☐ Other (please specify) _____

Digitalization

Q8. Which of the following digital channels and/or tools does your company use? (Please select one or more options)
☐ Website
☐ E-commerce managed internally
☐ E-commerce managed by third parties
☐ Big data analytics and advanced analytics
☐ Blockchain
☐ Cloud computing
☐ Internet of Things (IoT)
☐ Virtual reality and augmented reality tools
☐ Artificial intelligence and machine learning
☐ Social media for internal communications within the organization
☐ Social media for sales and marketing
☐ Email marketing and newsletters
☐ Apps for smartphones
☐ SMS and/or instant messaging
☐ Google AdWords
☐ Google Analytics
☐ Virtual marketplaces
☐ Marketing automation systems
☐ CRM

☐ EDI (Electronic Data Interchange) systems
☐ MRP (Manufacturing Resource and Planning) systems
☐ ERP (Enterprise resource planning) systems
☐ RFID (Radio Frequency Identification) systems
☐ Other (Please specify) _____

Q9. Which of the following digital channels and/or tools does your company plan to implement in the future? (Please select one or more options)
[SHOW OPTIONS NOT SELECTED IN Q8]

Q10. Thinking about the use of technology in the company where you work, evaluate your level of agreement with the following statements

	1= strongly disagree	2	3	4	5	6	7= strongly agree
Our company has developed a clear digitalization strategy	○	○	○	○	○	○	○
The quality of our digital solutions is superior compared to our competitors'	○	○	○	○	○	○	○
The features of our digital systems are superior compared to our competitors'	○	○	○	○	○	○	○
Our digital systems and technologies are slightly improved versions of existing products	○	○	○	○	○	○	○
Some of our digital solutions and technologies are new or have just been launched on the market	○	○	○	○	○	○	○
We are committed to using digital technologies in the development of new solutions (products/services)	○	○	○	○	○	○	○
Our products/services boast superior digital technology	○	○	○	○	○	○	○
New digital technologies are readily accepted in our company	○	○	○	○	○	○	○
We are always looking for opportunities to use digital technologies in our business processes	○	○	○	○	○	○	○
Our company looks for novel technological ideas by thinking outside the box	○	○	○	○	○	○	○
Our company bases its success on its ability to explore new technologies	○	○	○	○	○	○	○
Our company creates products or services that are innovative to the firm	○	○	○	○	○	○	○
Our company looks for creative ways to satisfy its customers' needs	○	○	○	○	○	○	○
Our company aggressively approach new market segments	○	○	○	○	○	○	○
Our company actively targets new customer groups	○	○	○	○	○	○	○
Our company commits to improve quality and lower cost	○	○	○	○	○	○	○
Our company continuously improves the reliability of its products and services	○	○	○	○	○	○	○
Our company increases the levels of automation in its operations	○	○	○	○	○	○	○
Our company constantly surveys existing customers' satisfaction	○	○	○	○	○	○	○
Our company fine-tunes what it offers to keep its current customers satisfied	○	○	○	○	○	○	○
Our company penetrates more deeply into its existing customer base	○	○	○	○	○	○	○

Q11. How important do you think the following objectives are for your company's digitalization strategy?

	1= Not important at all	2	3	4	5	6	7= Extremely important
Deeply transform business processes and/or business model	○	○	○	○	○	○	○
Improve customer experience and customer engagement	○	○	○	○	○	○	○
Improve innovation processes	○	○	○	○	○	○	○
Improve decision-making processes	○	○	○	○	○	○	○
Increase business efficiency	○	○	○	○	○	○	○

Q12. Thinking about the degree of digitalization of your company, you would define it

☐ Highly digitalized

☐ Moderately digitalized

☐ Limited digitalized

Q13. Does your company use or plan to use digital systems and technologies for...

	Currently used	Not currently, but in the next 12 months	Not currently and not expected in the next 12 months
Advertise/promote products/services to customers	❍	❍	❍
After-sales service	❍	❍	❍
Receive feedback and reviews from customers	❍	❍	❍
Engage/ build customer loyalty	❍	❍	❍
Collect customer information/ analyze customer behavior/ Market segmentation	❍	❍	❍
Stimulate demand	❍	❍	❍
Cross-selling actions	❍	❍	❍
Convey personalized promotions based on individual preferences	❍	❍	❍
Develop promotions through dynamic content	❍	❍	❍
Communicate in a personalized way	❍	❍	❍
Generate new insights and improve business intelligence	❍	❍	❍
Increase business efficiency by reducing time to market and costs	❍	❍	❍
Improve the customer experience	❍	❍	❍
Improve reporting and create shared dashboards	❍	❍	❍
Align departments and business functions	❍	❍	❍
Optimize warehouse flows and logistics management	❍	❍	❍
Optimize production	❍	❍	❍
Monitor multi-channel activities	❍	❍	❍

Q14. Evaluate the level of skills and competences within your company in the following areas

	1= Low	2	3	4	5	6	7= Excellent
Acquisition of relevant digital technologies	○	○	○	○	○	○	○
Identification of new opportunities in digital	○	○	○	○	○	○	○
Properly answering to digital transformation	○	○	○	○	○	○	○
Mastering cutting-edge digital technologies	○	○	○	○	○	○	○
Developing innovative products/services/processes using digital technologies	○	○	○	○	○	○	○

Q15. How satisfied are you with the digital systems and technologies your company is currently using?

1= Very dissatisfied	2	3	4	5	6	7= Very Satisfied
○	○	○	○	○	○	○

Q15b. [SHOW IF Q15 SCORE LESS THAN 5] What do you think are the areas for improvement of the digital systems and technologies currently in use?

Q16. What do you think are the main challenges or difficulties for the success of digital systems and technologies in your company? (Please select one or more options)

☐ Company culture
☐ System complexity
☐ Continuously evolving market dynamics
☐ Limited skills and dedicated resources within the teams
☐ Budget limitations
☐ Integration problems with company systems
☐ Internal organizational problems
☐ Other (please specify)_____

Q17. When considering the selection and purchase of digital systems and technologies, how important do you think the following aspects are for the purchase decision?

	1= Not important at all	2	3	4	5	6	7= Extremely important
Functional completeness	○	○	○	○	○	○	○
Ease of implementation	○	○	○	○	○	○	○
Easy to use	○	○	○	○	○	○	○
Level of technical support	○	○	○	○	○	○	○
Integration with the platforms used in the company	○	○	○	○	○	○	○
Dedicated training provided by the provider	○	○	○	○	○	○	○
Cost/Price	○	○	○	○	○	○	○
Recommendations received	○	○	○	○	○	○	○

Q18. In your company, who are the individuals responsible for deciding and approving purchases of digital systems and technologies? (Please select one or more options)

☐ President/ Vice President/ Member of the Board of Directors
☐ CEO/Legal representative
☐ Entrepreneur/Business owner
☐ General Manager
☐ Commercial director
☐ Marketing Director
☐ IT Director
☐ Production Director
☐ Logistics Director

☐ Managers
☐ Other (please specify) _____

Q19. Thinking about the data management systems and practices activated in your company, evaluate your level of agreement with the following statements

	1= strongly disagree	2	3	4	5	6	7= strongly agree
Our company has a dedicated network to share information with our main clients	○	○	○	○	○	○	○
Our internal and external sources of information are integrated and connected in real time	○	○	○	○	○	○	○
Our ordering system is integrated between the online and offline channels	○	○	○	○	○	○	○
We sell using different channels (personal selling, website, catalogue, mobile, social media, call centre)	○	○	○	○	○	○	○
We have integrated selling strategies between the online and offline channels	○	○	○	○	○	○	○
We use chatbots to interact with our customers	○	○	○	○	○	○	○
We are investing in artificial intelligence systems	○	○	○	○	○	○	○
We use big data analytics to predict future scenarios	○	○	○	○	○	○	○
We increasingly use social media to identify new business opportunities	○	○	○	○	○	○	○
Social media usage has improved the quality of the relationships with our clients	○	○	○	○	○	○	○

Q20. Thinking about CRM applications in your company, indicate your level of agreement with the following statements [SHOW ONLY IF CRM SELECTED IN Q8]

	1= strongly disagree	2	3	4	5	6	7= strongly agree
In our company the CRM system is integrated with other software and systems adopted internally	○	○	○	○	○	○	○
Our CRM system is able to integrate internal data provided by sellers with external data (distributors, intermediaries, etc.)	○	○	○	○	○	○	○
Our CRM system provides suggestions regarding the best actions that can be taken towards our customers	○	○	○	○	○	○	○
Our CRM collects information from digital channels (e-commerce, social media, blogs, etc.)	○	○	○	○	○	○	○
We use the dashboards generated by the CRM to generate insights	○	○	○	○	○	○	○

Q21. Thinking generally about your company, please rate your level of agreement with the following statements

	1= strongly disagree	2	3	4	5	6	7= strongly agree
We have frequent interactions with other industry players to generate new insights into product development	○	○	○	○	○	○	○
Our employees collaborate across functions and departments	○	○	○	○	○	○	○
We collect information informally (e.g. lunches, social events with customers, suppliers and other stakeholders)	○	○	○	○	○	○	○
We organize dedicated meetings with customers, suppliers and partners to encourage innovation in processes, products, logistics and distribution	○	○	○	○	○	○	○
We regularly interact with stakeholders from other sectors (e.g. associations, consultancy companies) to obtain information	○	○	○	○	○	○	○
We are quick to identify changes in the market and business environment	○	○	○	○	○	○	○
We are able to quickly identify new opportunities to satisfy our customers' needs	○	○	○	○	○	○	○
We quickly analyze and interpret changes in demand	○	○	○	○	○	○	○
We regularly evaluate the consequences of changes in demand	○	○	○	○	○	○	○
Our employees record and store newly acquired knowledge for future reference	○	○	○	○	○	○	○
We quickly recognize the added value of new knowledge coming from the external environment	○	○	○	○	○	○	○
Our employees tend NOT to share practical experiences with each other	○	○	○	○	○	○	○
The various company functions meet periodically to discuss product development and innovative processes	○	○	○	○	○	○	○
Everyone is aware of how tasks must be carried out within and between departments	○	○	○	○	○	○	○
We have a clear division of roles and responsibilities	○	○	○	○	○	○	○
We are constantly evaluating how to make the best use of knowledge	○	○	○	○	○	○	○
We have difficulty implementing new processes and developing new products	○	○	○	○	○	○	○
Our employees speak the same language when it comes to innovation practices	○	○	○	○	○	○	○

Q22. Concerning next year, how do you think your company's investments will change in the following areas?

	1= Riduzione importante del livello d'investimento	2	3	4= Mantenimento dello stesso livello di investimento	5	6	7= Aumento consistente del livello d'investimento
Optimization of multichannel strategies	○	○	○	○	○	○	○
Advanced Data Analytics	○	○	○	○	○	○	○
Artificial Intelligence and Machine Learning	○	○	○	○	○	○	○

Marketing Automation	○	○	○	○	○	○	○
Personalization and 1:1 marketing	○	○	○	○	○	○	○
MRP and ERP systems	○	○	○	○	○	○	○
Social Media	○	○	○	○	○	○	○
Mobile Apps	○	○	○	○	○	○	○
CRM	○	○	○	○	○	○	○

Closure profiling

Q23. What is your gender?
☐ Man
☐ Woman
☐ I prefer not to answer

Q24. What is your age?
☐ 18-24
☐ 25-34
☐ 35-44
☐ 45-54
☐ 55-64
☐ 65+

Q25. How many employees does your company have?
☐ Less than 10 employees
☐ 10 – 50 employees
☐ 51 – 250 employees
☐ Over 250 employees

Q26. In which turnover class does your company fall?
☐ Up to 2 million Euros
☐ 2 million – 10 million Euros
☐ 10 million – 50 million Euros
☐ Over 50 million Euros

Q27. Your company's turnover in the last 12 months is:
☐ Increased more than 5%
☐ Increased between 1 and 5%
☐ Remained unchanged
☐ Decreased between 1 and 5%
☐ Decreased by more than 5%
☐ I don't know