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Eleonora De Luca, Franco Ernesto Rubino
Laura Ferraro, Giovanna Crocco

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Digital Technologies and Sustainability in SMEs: A Virtuous Circle for Innovation and Growth

Eleonora De Luca,
Research Fellow,
University of Calabria,
Arcavacata (CS), Italy.

Franco Ernesto Rubino,
Full Professor,
University of Calabria,
Arcavacata (CS), Italy.

Laura Ferraro,
PhD Student,
University of Calabria,
Arcavacata (CS), Italy.

Giovanna Crocco,
Assistant Professor,
E-campus University, Novedrate (CO), Italy

Corresponding Author:

Eleonora De Luca

eleonora.deluca@unical.it

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ABSTRACT

This paper explores the relationship between digital transformation and sustainability, a topic that remains relatively underexplored compared to the individual study of each factor. In particular, the aim is to understand how integrating digital technologies with sustainability can generate tangible benefits for businesses, particularly SMEs. The method employed is qualitative, focusing on a case study of an Italian SME in the technology sector. Data was gathered through semi-structured questionnaires. To ensure the accuracy and validity of the data, secondary sources like company websites and both financial and non-financial reports were reviewed. The findings highlight a beneficial cycle linking technology and sustainability: digital advancements promote the uptake of sustainable methods, whereas sustainability encourages businesses to adopt more sophisticated technologies to enhance efficiency and competitive edge. As far as the authors are aware, this study is among the rare contributions that simultaneously examines digital transformation and sustainability within SMEs, offering a replicable model for other businesses.

Questo articolo esplora la relazione tra trasformazione digitale e sostenibilità, un argomento che rimane relativamente poco analizzato rispetto allo studio individuale di ciascun fattore. In particolare, l'obiettivo è comprendere come l'integrazione delle tecnologie digitali con la sostenibilità possa generare benefici tangibili per le imprese, in particolare per le PMI. Il metodo utilizzato è qualitativo e si concentra su un caso di studio di una PMI italiana nel settore tecnologico. I dati sono stati raccolti attraverso questionari semi-strutturati. Per garantire l'accuratezza e la validità dei dati, sono state esaminate fonti secondarie come i siti web delle aziende e i rapporti finanziari e non finanziari. I risultati evidenziano un ciclo benefico che collega tecnologia e sostenibilità: i progressi digitali promuovono l'adozione di metodi sostenibili, mentre la sostenibilità incoraggia le aziende ad adottare tecnologie più sofisticate per migliorare l'efficienza e il vantaggio competitivo. Per quanto ne sanno gli autori, questo studio è tra i rari contributi che esamina contemporaneamente la trasformazione digitale e la sostenibilità all'interno delle PMI, offrendo un modello replicabile per altre imprese.

Keywords: digital transformation, sustainability, business innovation, SMEs, case study

1 – Introduction

Sustainability and digital transformation have recently garnered significant attention, representing major trends that influence and shape the economy and society. The strategic combination of sustainability and digital technologies holds immense potential to generate positive environmental and social impact (Rosário & Dias, 2022) while ensuring long-term sustainability. A responsible commitment to sustainability and the use of advanced technologies provide a competitive edge, enhancing efficiency and delivering advantages for both the environment and society.

The fourth industrial revolution, referred to as Industry 4.0, along with the accompanying digital transformation, impacts competition norms, the labor market, social and environmental standards, and educational priorities (Ghobakhloo et al., 2021). According to Stefano Epifani, a Professor at the Digital Transformation Institute, "*Sustainability cannot do without digital transformation*", indicating that technology is a key component of the innovation framework. Digital transformation's most significant impact on business practices is the creation of a "global economy". The Internet has empowered companies, including small and medium-sized enterprises (SMEs), to expand globally and grow into new markets (Lee et al., 2021; Kuik et al., 2023). These types of enterprises not only comprise the entrepreneurial fabric of Italy and Europe but also lead the transition towards an increasingly digitized and sustainable economy. Indeed, in many countries, SMEs are seen as growth laboratories for innovation, for the development of a circular economy and a more sustainable future (Kuik et al., 2023). In particular, SMEs account for 90% of all economic activities and 50% of employment worldwide, particularly among women (Melo et al., 2023).

Companies employ digital technologies to create solutions for social issues, which are vital pillars of sustainability, alongside environmental and economic factors (Purvis et al., 2019). Therefore, digital transformation fosters an environment conducive to achieving the Sustainable Development Goals (SDGs) by providing numerous growth opportunities for businesses (Castro et al., 2021; Chauhan et al., 2022). Meanwhile, sustainability promotes a favorable setting for innovation and the integration of advanced technologies. In the literature, there are several studies analysing the issues of sustainability and digital transformation separately (Purvis et al., 2019; Baalouch et al., 2019; Papadopoulos et al., 2020; Omrani et al., 2022); to date, however, those that examine the link between sustainability and digital transformation are still limited (Castro et al., 2021; Chauhan et al., 2022; Rosário & Dias, 2022) and even more limited are those that study these issues in the context of SMEs (Bai et al., 2021). Indeed, internal factors driving environmental sustainability and digital development in SMEs, as well as their interactions, have received limited attention in the literature (Bai et al., 2021). For this reason, the work aims to analyse the relationship between digital transformation and sustainability through the study of an SME in order to identify best practices that can serve as a reference for companies wishing to develop digital and sustainable strategies.

This work primarily contributes a replicable model that combines digital transformation and sustainability in SMEs. In contrast to much existing research that examines these topics independently, this study illustrates the interdependence of technology and sustainability, forming a virtuous cycle that enhances competitiveness, efficiency, and environmental impact. Additionally, the case study analysis reveals the nuances and practical strategies employed by the company in integrating technological innovation with sustainability, providing valuable insights for future research as well as guidance for managers and policymakers.

The paper is structured as follows: *Section 2* provides a theoretical background for two key concepts: Digital Transformation and Sustainability. Additionally, it examines the overlap between digitization and sustainability concerning SMEs. *Section 3* outlines the research design and methodology used, including details of the case study. *Section 4* discusses the key findings. Finally, *Section 5* contains conclusions, implications, and suggestions for future research.

2 – Theoretical background

This research is based on two main concepts: Digital transformation and Sustainability. The following subsections include the main definitions and dynamics of these concepts. Additionally, the convergence between sustainability and digitization in the context of SMEs is explored.

2.1 – *Digital transformation and sustainability*

Digital transformation is essential for maintaining business continuity. The swift advancement of digital technologies has significantly altered business operations (Rosário & Dias, 2022). Companies that fail to modernize their organizational and competitive strategies will inevitably face diminished stakeholder interest. Furthermore, the use of new digital technologies can reduce the likelihood of external crises and introduce significant changes in business operations by providing more competitive and sustainable business models (Vrontis et al., 2022). The term "digital evolution" or "digital transformation" refers to a wide-ranging topic, identifying "a set of predominantly technological, cultural, organisational, social, creative, and managerial changes associated with digital technology applications in all aspects of human society" (Stolterman & Fors, 2004). This intricate journey goes beyond merely improving traditional methods; it fosters new innovations marked by swift and significant transformations impacting all management sectors within the company. This sets the stage for redefining corporate strategies and relationships with supply chain stakeholders and the market (Rosário & Dias, 2022). When digital transformation meets sustainability, it generates innovations in business models that utilize digital technologies as a tool for sustainable development. Indeed, sustainability has become a moral and economic imperative for businesses worldwide (Castro et al., 2021).

Despite its great importance, the concept of sustainability only gained mainstream recognition in the 20th century (Rosário & Dias, 2022). However, according to Purvis et al. (2019), hints of sustainability began to appear in the shadow of the first industrial revolution when the inherent trade-offs between wealth generation and social development were recognised. Concepts such as biodiversity, natural resources, sustainable urbanization, human rights, cultural diversity, resource distribution, access to equal opportunities, security, and social cohesion become important (Rosário & Dias, 2022). Over time, the notion that business success extends beyond purely economic measures to encompass environmental and social factors has gained increasing acceptance (Gibbes et al., 2020). Attracting the attention of academics is the possible interaction between sustainability and digital transformation (Massaro et al., 2021). The convergence of these two terms is perceived as a winning combination, not without challenges, offering opportunities and competitive advantages (Denicolai et al., 2021). The central idea of green industry and digital transformation is to improve the deterioration of

economic, ecological, and social conditions by using new industrial technologies and integrating more efficient production processes (Šimberová et al., 2022).

A strand of literature suggests that digital transformation presents promising opportunities for mitigating and addressing business sustainability issues (Luthra et al., 2020; Guandalini, 2022). The contribution of Industry 4.0 to sustainability can vary significantly, favouring the implementation of production methods and business models that promote the circular economy (Chauhan et al., 2022). Giordino et al. (2024) highlight that, in their study of the cement sector, digital technologies aid in the gathering, analysis, and reporting of corporate sustainability data. They stress the need to incorporate these technologies into management models to foster more sustainable and efficient business operations. Artificial intelligence, big data, blockchain, and the Internet of Things (IoT) are considered, if implemented properly, possible solutions to problems related to the sustainable business economy (Chauhan et al., 2022). According to other studies, on the other hand, without considering sustainability, the exponential growth of technologies would lead to disastrous consequences for humanity, generating negative environmental impacts and exacerbating social divides (Etzion and Aragon-Correa, 2016; Tick et al., 2022). According to Pellicelli and Garrone (2024), sustainability can serve as a catalyst for growth when it is fully integrated into business models and embraced by all stakeholders. A strong focus on corporate sustainability is a solution to the problems and challenges posed by digital transformation (Ricci et al., 2020). Indeed, a focus on responsible innovation could prevent or mitigate the negative effects of digitalisation by considering social and ethical factors and balancing economic, social, and environmental benefits (Zhang et al., 2023).

2.2 – *Digital transformation and sustainability in SMEs*

Nowadays, small and medium-sized enterprises (SMEs) are being encouraged to follow more complex growth paths in order to strengthen their competitiveness and keep pace with technological and digital evolution (Denicolai et al., 2021). These SMEs, in turn, are crucial for achieving sustainability by advancing business models rooted in the circular economy (Khan et al., 2022). Corporate environmental sustainability encompasses a range of strategies, processes, measures, and initiatives designed to enhance the positive impact of organizations on the natural environment (Global Reporting Initiative [GRI], 2014). In the European Union, SMEs contribute to 64% of the total environmental impact. Therefore, it is essential for these businesses to improve their environmental performance while also advocating for transformative changes within their industries (Isensee et al., 2020). By adopting circular economy practices, SMEs can significantly enhance their sustainability (Khan et al., 2022) and potentially become innovation leaders, particularly if they address their structural challenges (Francesconi & Tanda, 2024). Numerous studies have focused on sustainability and its impact on competitiveness (Lloret, 2016; Hermundsdottir & Aspelund, 2021), as well as the financial performance of companies (Ameer & Othman, 2012; Bodhanwala & Bodhanwala, 2018).

Moreover, there is a strong correlation between sustainability reporting and a high ESG performance with enhanced company value and profitability (Zhou et al., 2022; Yildiz et al., 2024), as well as improved operational efficiency and diminished regulatory and reputational risks (Alsayegh et al., 2020; Tang et al., 2024). However, most studies on sustainability in the SMEs context focus mainly on barriers, drivers, and strategies to improve sustainability in these organisations (Johnson & Schaltegger, 2016; Caldera et al., 2018; Journeault et al., 2021; Salvador et al., 2023).

With the advent of Industry 4.0, everything is seamlessly integrated into a hyper-connected and decentralized production system, capable of real-time and autonomous adaptation to its environment (Ghobakhloo et al., 2021). There are numerous studies focusing on the implementation and application of digital technologies in large companies, whereas there are few studies examining the same topic in SMEs (Melo et al., 2023; Voza et al., 2022; Roman & Rusu, 2022; Raimo et al., 2022). Particularly, the cultural factor significantly affects the delay in digital transformation in SMEs, as there is still a certain aversion to change, also due to economic reasons (Cioppi, 2011). Digital transformation is not only a technological upgrade but also a change in corporate philosophy, strategy, and organization, which requires comprehensive planning (Teng et al., 2022). It involves a shift in mindset, a new definition of business strategy that necessitates flexibility and adaptation to effectively respond to market and customer needs (Del Baldo et al., 2022).

The digital transformation represents the key element of innovation and business renewal for SMEs (Voza et al, 2022). In particular, SMEs drive new industries and serve as the backbone for applying digital technologies. Indeed, they play a crucial role in increasing employment, promoting economic growth, fostering technological innovation, and enhancing social harmony (Zhang et al., 2023). Digital tools can help SMEs connect with suppliers and customers to ensure resilient and sustainable supply chain activities (Bai et al., 2020). The adoption of digital technologies can boost the competitiveness, productivity and performance of SMEs (Roman & Rusu, 2022). For SMEs, it is a complex process that requires both specific resources and skills and the creation of favorable systemic conditions at the country level (Raimo et al., 2022; D'Angella et al., 2025). Furthermore, digitisation can help make sustainability information more readily available and linkable with other sources, providing quick access to information through the Internet and developing sustainable awareness (Bai et al., 2021).

Overall, the literature suggests that SMEs, despite structural and cultural challenges, occupy a key position in both technology adoption and sustainability progress (Isensee et al., 2020; Martínez-Peláez et al., 2023). Although there is growing recognition of the role of SMEs in defining circular and resilient business models, few studies explore the strategic interconnection between digital transformation and sustainability within these companies. Additionally, there is insufficient understanding of how digital technologies can be integrated with sustainability strategies to create enduring value for SMEs. This research therefore aims to fill this gap by investigating how their integration can unlock long-term competitive advantages in the context of SMEs.

Accordingly, our research question is as follows:

RQ: *How do SMEs perceive the synergies between sustainability and digital transformation?*

3 – Methodology

The research employs a qualitative methodology, utilizing case study analysis. A case study is defined as "*an empirical investigation that examines a contemporary phenomenon in its actual context, especially when the boundaries between phenomenon and context are not clearly defined* (Yin, 2018*). It is in-depth research on a specific case, with the aim of understanding the complexity and internal dynamics of the analysed phenomenon* (Stake, 1995)". Specifically, employing the case study methodology enables precise responses to the questions of "how" and "why" certain phenomena arise in a specific context (Yin, 2018). This methodology enables the investigation

of complex phenomena that are still relatively underexplored (Yin, 2009). Case studies employ a range of data collection methods, including the use of archives, interviews, questionnaires, and observations (Eisenhardt, 1989).

The choice to perform this analysis arises from the observation that much of the existing literature on the intersection of digital transformation and sustainability primarily employs quantitative methods. Therefore, the particular aim of this research is to utilize a qualitative approach to examine an Italian SME, seeking to uncover the advantages of merging digital transformation with sustainability. After having identified what the objective of the study is, it is essential to analyse other factors in order to proceed:

a – Reference context: The selected case must be a digitized and sustainable SME.

b – Geographical context: This must concern Italian SMEs, as our territory is predominantly comprised of this type of company.

c – Essential elements: in addition to the financial report, it must have drawn up a sustainability report or impact report.

d – Time period: The collection of information must have taken place within a relatively short time period (between June and September 2024). The choice of a short time period is justified by the desire to avoid possible anomalies that could occur during the administration of questionnaires over extended periods (Raimo et al., 2023).

The primary data collection process was conducted through the administration of a semi-structured questionnaire sent to the IT manager, the head of corporate social responsibility (CSR) practices, the research and development area, and a sample of company employees. The decision to conduct a semi-structured questionnaire stems from the desire to avoid influencing the answers by administering only closed-ended questions.

Additionally, secondary sources such as websites, sustainability reports, financial statements, and online news were also utilized. Indeed, literature argues that secondary data can provide insights into actions, events, and reasons that would otherwise be difficult to access quickly (Stake, 1995).

The questionnaire was divided into five sections: (1) Corporate vision on sustainability, (2) Digital transformation and adopted technologies, (3) Research and development (R&D), (4) Synergy between sustainability and digital, and (5) Future and corporate strategies. The first section examines perceptions of sustainability, motivations for adopting sustainable practices, and the impact of B Corp certification. The second section focuses on the business model, digitisation objectives, and key technologies adopted. The third section delves into the resources invested and key areas of innovation. The fourth section examines the integration of digital technologies and sustainable practices, highlighting both the benefits and challenges. Finally, the last section discusses the company's plans for digitization and sustainability, as well as offers suggestions for other companies seeking to enhance their level of digitization and adopt sustainable practices.

Different data sources were gathered to facilitate effective triangulation and achieve reliable, precise, and valid research findings (Miles, 1994). In reality, examining a case study necessitates multiple sources of evidence to guarantee accurate results for the research at hand (Eisenhardt, 1989). Data triangulation involves applying multiple methods or sources to gain a comprehensive understanding of the phenomenon being studied. Indeed, using multiple data sources allows for cross-validation checks (Patton, 1999).

3.1 – *Case Study*

Company X belongs to the technology sector and develops "system integration" services to support companies in digital transformation. It is one of the leading Italian players in the IT Consulting sector. The company is based in northern Italy and is a benefit corporation as well as the first Italian "B Corp" listed on the Euronext Growth Milan (EGM) market of the Italian Stock Exchange. The legal form of a benefit corporation underlines its commitment to responsibly pursuing business objectives. It is the first Italian-listed company to receive this recognition, awarded by the non-profit organization B Lab.

Company X offers a wide range of services to support digital transformation, helping companies innovate and optimize their processes through advanced technological solutions, including IT Solutions. Company X delivers its services through the integration of Key Enabling Technologies (KET), utilizing advanced Cybersecurity solutions to protect organizations from cyber threats, Big Data and Analytics tools to analyze large volumes of data and support strategic decisions, and Artificial Intelligence technologies to enhance security, efficiency, and innovation. Furthermore, it implements Internet of Things (IoT) solutions to connect devices and automate processes, while Cloud Computing enables secure and efficient management of corporate data.

Company X's strategy is based on four fundamental pillars that guide its activities and commitment to a sustainable and responsible development model. The first element is interdependence, which manifests as a strong bond with the territory and a particular focus on training and integrating new generations, as well as the most disadvantaged groups, into the world of work. This approach aims to create an inclusive and dynamic entrepreneurial ecosystem that encourages the growth of local communities. Another central aspect is the valorization of people, which takes shape in the creation of a corporate welfare system that develops employee skills and attracts top talent. The company recognizes that human capital represents the heart of its growth, and for this reason, invests in initiatives that enhance the well-being and motivation of its workers. Simultaneously, the company is devoted to developing innovative and sustainable business solutions by crafting services and products that yield positive social and environmental impacts. The aim is to integrate technology with sustainability to provide competitive and responsible business models. Finally, the company aims to become a reference point in its sector through environmental policies designed to reduce resource use and climate-altering emissions. It promotes initiatives to raise awareness among its stakeholders regarding sustainability issues and encourages the adoption of responsible practices, helping to foster a corporate culture focused on environmental protection and social responsibility. Thus, it is evident that this company has always prioritized respect for the environment and its employees as key values. Specifically, alongside the impact report released since 2020, the company has launched an initiative in 2022 designed to enhance the overall quality of information available to all stakeholders. To this end, it has begun to publish, on a voluntary basis, an integrated report that includes not only information relating to the financial statements and the explanatory notes, but also data on sustainability issues.

4 – Results

Based on the analysis conducted, it can be stated that for company X, it is essential to take a proactive role in the digital transformation and innovation process, adopting a sustainable development model that enables it to consolidate its position in the IT market.

The main goal of innovation is to enhance people's quality of life. Change processes should promote collective growth instead of focusing solely on individuals. Achieving this involves building strong relationships with the community, following ESG principles, fostering greater collaboration and co-design with stakeholders, and, most importantly, enhancing human capital and nurturing young talent. Specifically, it aids its clients in identifying and seizing new business opportunities while ensuring the development of IT infrastructures and platforms to meet innovation demands. Additionally, it provides application solutions for managing business processes, facilitating information sharing, and supporting collaboration. The company consistently dedicates itself to territorial development by maintaining connections with local associations and organizations that foster the growth of new professionals and link international partners with local enterprises.

4. 1 – *Sustainability*

The analysis of sustainability-related information allowed for a deeper understanding of the company's business activities and their effects on the economy, the environment, and society. These effects reflect the company's positive role in promoting sustainable development. Specifically, the company noted that it embraces virtuous and regenerative practices that generate value for the planet, communities, and individuals. Indeed, their "Sustainable IT" models embody technological innovation while functioning with transparency, responsibility, interdependence, and inclusivity. Specifically, the "green" technologies used allow to minimize the negative impact on the environment because it uses technological solutions that minimize energy consumption and optimize resources to reduce the ecological footprint; uses renewable energy (e.g. solar and wind energy); reuses and recycles technological components to minimize electronic waste; reduces energy consumption thanks to the design and use of software that reduces the workload of machines. The company's focus on sustainability is also evident in its internal structure. Moreover, within the structure, cutting-edge machines and technologies are flanked by fruit trees of various species. From a circular economy perspective, the floors are made of recycled wood, and all other non-masonry parts are made of recyclable materials, such as glass and aluminum. Additionally, to reduce energy waste, the switching on and off of lights has been centralized and automated.

4.2 – *Investment in innovative technologies*

Digital transformation is seen as the center of change, and new investments in green technologies and technological innovation enhance corporate competitiveness, while also representing a support for social and environmental progress. Company X is particularly committed to research and development, and over the years, it has been investing increasingly in the creation of technological solutions based on a sustainable and inclusive development model.

As can also be observed from the data reported in the balance sheet, under the item *'Increase in fixed assets for internal works',* it is possible to note an evolution.

Over the last year, there has been a significant increase, indicating a strengthening of efforts in technological innovation and the development of internal projects. These investments are generally linked to the digitalization and innovation of business services, with a focus on advanced technological solutions. Not only does sustainability improve a company's competitiveness, but it also facilitates the adoption of digital technologies (Table 1).

Table 1 – Increase in fixed assets for internal works (*Source*: own elaboration)

2020	2021	2022	2023
€20.235	-------	€8.422	€42.029

Digital transformation allows companies to remain competitive in an increasingly dynamic and technologically advanced market. Technologies, such as Cloud Computing and Digital Adoption platforms, improve efficiency and operational flexibility, minimizing costs related to physical infrastructure and improving resource management. Furthermore, the use of artificial intelligence and machine learning reduces time and improves the quality of products and services offered. Moreover, transparency and access to real-time data enhance interaction with customers and business partners, creating stronger relationships.

4.3 – *Technology and Sustainability: A Virtuous Circle*

For company X, embracing digital technologies aligns with their sustainability goals; conversely, sustainability drives the company to adopt innovative processes that enhance efficiency. Therefore, from a corporate perspective, it would seem that using an integrated vision, where technology and sustainability support each other, ensures a more responsible and competitive business. Two directives stand out:

1. *Sustainability as a driver for technological innovation*. The company's commitment to sustainability and the circular economy has prompted new investments in innovative, sustainable technologies that support digitalization and enhance operational efficiency.

2. *Technology as a catalyst for sustainability*. Investment in green technologies and sustainable digital solutions not only improves operational efficiency but also contributes to reducing emissions and improving energy performance.

Technology drives sustainability, but at the same time, sustainability drives the adoption of more advanced technologies to improve efficiency and innovation, triggering a virtuous circle in which technology and sustainability mutually reinforce each other. The circular diagram (Figure 1) exemplifies the strategic interdependence among sustainability, technological innovation, efficiency improvements, and sustainability impact. Each component strengthens the next, generating a continuous virtuous circle of value creation that enhances competitiveness, social responsibility, and performance.

According to the data and information collected on society, the adoption of technologies is linked to the desire to reduce environmental impact, improve energy efficiency, and promote social well-being. Table 2 summarizes the main results and benefits observed.

5 – Conclusion

In recent years, there has been a significant global surge in interest regarding sustainability and digital transformation. This shift is partly driven by the rising indicators of unsustainability, with the two topics often studied in isolation or viewed as interdependent. Despite their potential as growth and competitiveness drivers, SMEs frequently view sustainability and digital transformation as economic burdens they would rather avoid. To highlight the

advantages of embracing these elements, this study seeks to clarify how their integration can yield tangible benefits for companies. The goal is to identify best practices that can inspire and guide companies aiming to create positive social and environmental impacts while adopting digital technologies, ultimately enabling SMEs to be competitive, responsible, and efficient on an international scale.

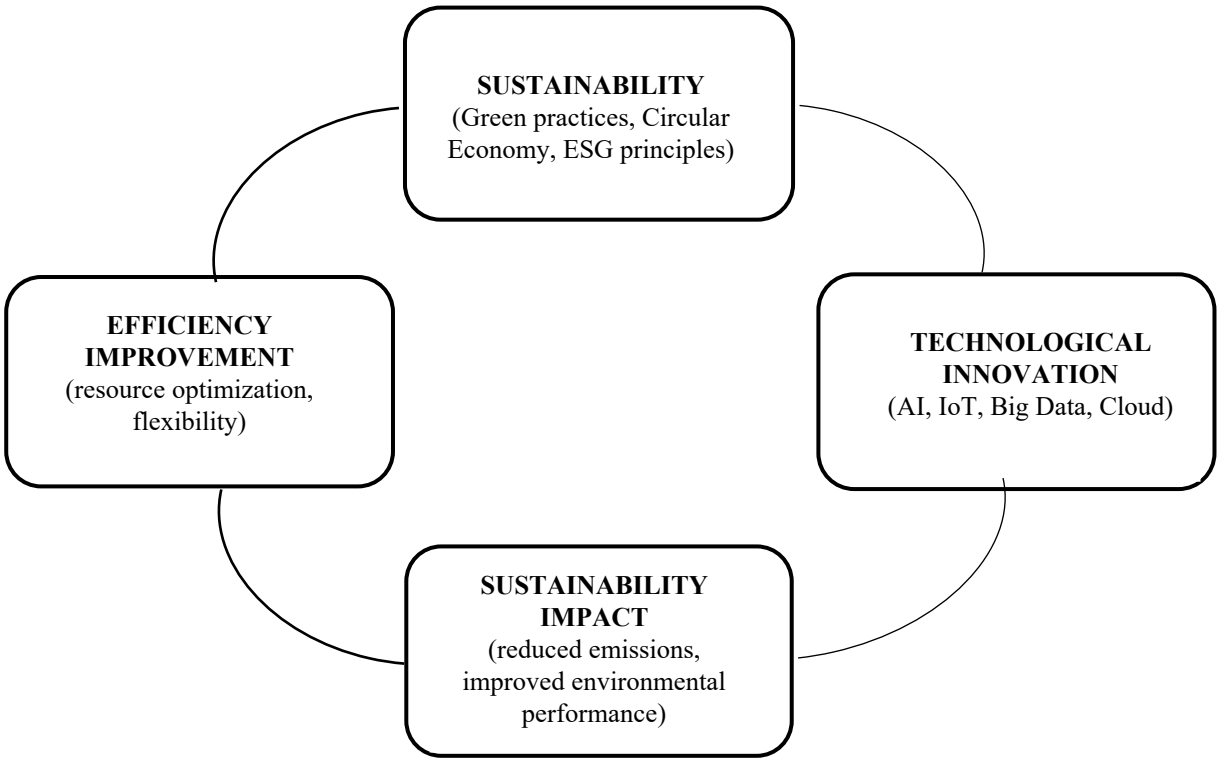

Fig. 1 – Virtuous Circle (*Source*: own elaboration)

The strategic combination of sustainability and digital technologies indeed holds immense potential to generate positive environmental and social impacts while ensuring long-term sustainability SMEs. The two elements should be integrated into the company strategy and seen as a core value, not merely a secondary concern or obligation. Green technologies, the digitalization of business processes, and the adoption of intelligent solutions for resource management, combined with a strong commitment to social responsibility, should, in fact, be the heart of company strategies. Digital transformation is the key element of corporate renewal for SMEs. Similarly, companies that show a greater tendency toward sustainability in their digital processes develop enhanced capacity for value creation, along with improved cooperation and communication with all stakeholders. The connection between these two essential factors not only boosts the competitiveness of companies but also contributes to building a more sustainable future, generating a positive impact on economic, social, and environmental levels.

This study investigated how Italian SMEs perceive the synergies between sustainability and digital transformation, aiming to comprehend the extent to which and the manner in which these two dimensions are integrated into strategic and organizational practices. The synergy between sustainability and digital transformation is clearly evident in our case study, which serves as a reference model for other SMEs seeking to integrate sustainability and digitalization

into their business processes. In fact, the model of company X is based on solid principles of social and environmental responsibility, the result of a long-term strategic vision. The company emphasizes its responsibility towards the planet and the environment, while also enhancing human capital and promoting inclusion through digital technologies. It recognizes that digital transformation is not merely a goal for market compliance, but a crucial catalyst for sustainability. The adoption of green technologies not only offers a competitive edge but also creates significant value for society and the environment.

Table 2 – Key findings and benefits (*Source*: own elaboration**)**

	Results	**Benefits**
Corporate sustainability	Company X considers sustainability a fundamental principle and adopts "Sustainable IT" models, minimizing environmental impact, thanks to the use of renewable energies and technology recycling.	Improving corporate image and reducing costs
Investment in innovative Technologies	Increased investment in green technologies	Improving operational efficiency and competitiveness
Interaction between digital and sustainability	Technology and sustainability influence each other.	More innovation, reduced emissions, improved performance.
Digitalization	Process automation	More flexibility, better resource management, process optimization.
Future strategies	Increasing commitment to R&D for sustainable technological solutions.	Continuous innovation, increased competitiveness and support for social progress and environmental improvement

5.1 – *Implications, limitations, and future research*

This study contributes to the academic literature by highlighting both theoretical and practical implications. When considering theoretical implications, it becomes evident that digital transformation in small and medium-sized enterprises (SMEs) fosters the development of new circular economy models and mitigates environmental impact. In this context, digital technologies are viewed not just as efficiency tools but also as enablers of sustainable business models. Additionally, a theoretical framework is suggested that underscores the beneficial relationship between digital innovation and sustainability, illustrating how these two factors mutually enhance each other in generating business value. This perspective offers a strategic insight into how digital technologies can drive sustainability and, conversely, how sustainability can promote digital advancements.

In terms of practical implications, the increased transparency of processes enabled by digital technologies fosters trust among companies, customers, investors, and local communities. Additionally, embracing sustainable practices enhances a company's positioning, bolsters its

reputation, and improves its capability to attract talent and investments. Ultimately, it is evident that the synergy between digital technologies and sustainability is not merely a trend, but a strategic imperative for SMEs aiming to remain competitive in the global market.

Although this work contributes to the literature, it is not free from limitations. Firstly, the analysis is based on a single case study, which allows for an in-depth exploration of specific dynamics; however, the generalizability of the results is limited. Furthermore, the research examines an Italian SME, which restricts the possibility of extrapolating the results to other international contexts.

Future research could focus on quantitative methodologies to strengthen empirical evidence or on a comparative analysis that examines a company successfully integrating digitalization and sustainability into its business versus one that has yet to adopt these strategies. This comparison would allow for identifying differences in performance, competitive advantages, and environmental impacts. Furthermore, the role of technologies such as the Internet of Things (IoT), artificial intelligence (AI), and cloud computing in the development of digital and sustainable business models could be explored.

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