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Literature Review

Innovation and Transformation: Keys to the Success of SMEs in the Digital Age

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Abstract: This article examines the strategic importance of Small and Medium Enterprises (SMEs) in the global economy, emphasizing their agility and innovation alongside the challenges they encounter in adopting new technologies. SMEs, constituting 90-95% of all global enterprises and responsible for 60% of employment, contribute to GDP, economic diversification, and community development. The study reviews a broad spectrum of literature to highlight the role of emerging technologies in enhancing operational efficiency and decision-making within SMEs while recognizing significant obstacles such as financial and human resource limitations and increased cybersecurity risks. Using a mixed-methods approach, this research assesses the impact of technological advancements on a diverse range of SMEs, ensuring generalizability and reinforcing the study's validity and reliability. It identifies a gap in empirical knowledge on technology integration and offers insights into the dual opportunities and challenges digital tools present. The findings suggest that while SMEs greatly benefit from technological progress, adequate policy support is crucial for overcoming implementation hurdles, guiding strategic technology investments, and fostering economic sustainability and competitiveness in the digital era.

Keywords: SMEs; technologies; technological innovation; technology adoption; business competitiveness; digital era

1. Introduction

Small and medium-sized enterprises (SMEs) are vital in the global economy, defined primarily by their limited number of employees and annual revenues. These entities, often run by their owners or a small group of individuals, are recognised for their agile decision-making and remarkable ability to adapt quickly to changing market dynamics (Alraja et al., 2021; Roffia et al., 2021). In the current economic context, SMEs contribute significantly to employment generation, accounting for approximately 60% of global employment, and are central to the Gross Domestic Product (GDP) and overall prosperity of nations (Costa Melo et al., 2023).

Moreover, SMEs foster robust competition in the marketplace, stimulating business efficiency and broadening the spectrum of products and services available to consumers (Romero Luna, 2006; Solís & Elgoibar, 2019). Remarkably, these firms account for 90-95% of all worldwide, underscoring their critical role in the international economic fabric (Salman & Oly Ndubisi, 2006; Annosi et al., 2023). Beyond their economic impact, SMEs are crucial in developing local communities and building robust and sustainable economies. This multifaceted role highlights the strategic importance of SMEs in the contemporary business environment (Solís & Elgoibar, 2019).

Cohen and Levinthal (1990) define innovation as a compendium of organisational processes and routines that enable a firm to seek, acquire, assimilate and apply resources effectively. This capability is crucial for firms seeking to remain competitive in a market characterised by constant rivalry and change (Ramírez et al., 2022). In the context of the digital age, technology plays a fundamental role in impacting various aspects of society. The globalisation of connectivity has eliminated geographical barriers, facilitating instant communication and international collaboration. In addition, continuous technological innovation drives significant improvements in various sectors, raising people's quality of life

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(Bijker, 2005).

From a business perspective, adopting new technologies increases operational efficiency. Tools such as automation, data analytics and artificial intelligence optimise processes, reduce costs, and improve decision-making (Quero, 2016; Ramdani et al., 2021). In addition, expanding technologies facilitates access to information, allowing individuals to acquire knowledge more quickly and efficiently (Caribe, 2021). Finally, new technologies have radically transformed how we live, work and interact, creating opportunities for constant innovation and personal and business development in an increasingly digitised world (Bijker, 2005; Caribe, 2021). This phenomenon underlines the importance of adapting and evolving in response to technological advances to ensure future success and sustainability.

The integration of new technologies into the business environment poses significant challenges for SMEs despite the clear benefits that their adoption can offer. A primary challenge is the limited financial capacity of many SMEs, which hinders the realisation of the necessary initial investments. This financial constraint is often compounded by a need for specialised staff, preventing SMEs from having the necessary internal resources to manage and maximise these advanced technologies. Furthermore, resistance to change and insufficient understanding of the long-term benefits are additional barriers. This is due to the need for clarity on how emerging technologies can improve operational efficiency and overall business performance.

The main objective of this research is to examine the adoption of new technologies by small and medium-sized enterprises (SMEs). This study focuses on identifying and analysing current trends in SMEs' use of new technologies, as well as assessing the benefits and challenges faced by these firms in the technology adoption process. The research seeks to comprehensively understand the contemporary dynamics shaping the business environment regarding technological innovation. By recognising these trends and analysing the experiences of SMEs, the study aims to sketch a picture of recent practices and lay the groundwork for anticipating future directions in this sector. This exploration is crucial to understanding how SMEs navigate the changing technological landscape and how these innovations impact their competitiveness and growth.

2. Materials and Methods

This study employed a literature review approach to examine the adoption of new technologies by SMEs. The research was conducted in three main stages: defining search and selection criteria, collecting relevant articles, and analysing and interpreting the results. The study sample consisted of scientific articles published between 2010 and 2023 in high-impact indexed journals, focusing on technological innovation and digitalisation in SMEs. Academic databases such as Web of Science, Scopus, and Google Scholar were used for article searches. The inclusion criteria encompassed empirical and theoretical studies that specifically addressed technological adoption in SMEs, the impact of new technologies on their operations, and the associated challenges and opportunities. Non-peer-reviewed articles and those not explicitly focused on SMEs were excluded. Data collection involved systematically extracting relevant information from the selected articles, including methodologies employed, primary findings, and conclusions. A narrative synthesis approach was used for data analysis, identifying recurring themes, trends, and gaps in the existing literature. This qualitative methodology was chosen for its ability to provide a deep understanding of emerging trends and current dynamics in technological innovation among SMEs. The detailed and critical analysis of rigorously selected academic sources allowed the identification of the most significant emerging technologies in the context of SMEs and elucidated underlying patterns and trends. Additionally, the study investigated the concrete benefits and potential barriers SMEs face in adopting new technologies, exploring how these technologies can be effectively applied and the limiting factors that may impede their successful integration. All data and protocols related to this review are available to readers, ensuring the study's transparency and reproducibility.

3. Results and Discussion

3.1. Types of new technology

The integration of new technologies is fundamental in the process of transformation and modernisation of SMEs. This phenomenon is reshaping the operations and management of these enterprises and expanding their opportunities to compete in an increasingly competitive

global marketplace (León-Gómez et al., 2022). Despite facing significant challenges such as limited resources and restricted access to capital compared to large corporations, adopting advanced technologies such as Artificial Intelligence, cloud computing and the Internet of Things (IoT) facilitates a more level playing field in the business environment (Palacios-Manzano et al., 2021).

This article examines in detail how SMEs are adopting these emerging technologies, identifies the obstacles they face during this process and assesses the positive impact this technology adoption can have on their operational performance, market positioning and contribution to economic development. Through the analysis of current trends, the study of representative case studies and the evaluation of relevant data, it aims to provide a comprehensive analysis of how technology adoption is becoming a key pillar for the sustainability and growth of SMEs in the contemporary economic landscape. This study seeks to deepen the understanding of technology's role in strengthening and transforming the SME sector, high-lighting the benefits and barriers to its effective implementation. This approach provides valuable insights for academics, business managers and policymakers seeking to support technology development in the SME segment.

3.1.1. Internet of Things (IoT)

In the last decade, the Internet of Things (IoT) has emerged as a critically crucial technological development, capturing the attention of organisations, industries and researchers worldwide. IoT plays a fundamental role in collecting and processing data from remote locations, significantly optimising the efficiency of distributed systems and improving people's daily lives (Sami et al., 2023). This advance represents a complex network that facilitates interaction and communication between smart devices, improving the location and management of re-sources. Through IoT, a wide variety of devices can be connected to the Internet, enabling the monitoring of multiple aspects of daily life, from home automation to environmental monitoring (Bi et al., 2023).

IoT is currently applied in many fields, such as residential automation, construction, healthcare, agriculture, traffic management, education, environmental protection, and radiation and pollution monitoring (Alvear-Puertas et al., 2017). Within this context, IoT stands out for its capacity for autonomous learning, rapid deployment, better understanding and analysis of data, and the ability to protect against fraudulent activities and cyber-attacks while maintaining users' privacy (Suciu et al., 2021).

IoT, far from being a revolution that displaces existing technologies, integrates and extends the capabilities of current technologies, creating new ways of communication and operation (Chen et al., 2014). With the advancement of IoT, new opportunities emerge to meet business demands and develop innovative services based on real-time data from the real world (Chen et al., 2014).

3.1.2. Artificial Intelligence and Machine learning

Artificial Intelligence (AI) is an advanced field of computer science dedicated to simulating human intelligence and cognitive capabilities through computer systems. This technology encompasses reasoning, learning, problem-solving, trend prediction and decision-making (de Tyler et al., 2023). The application of AI is wide and varied, from improving business productivity by optimising and automating processes and freeing employees from repetitive tasks to automating the analysis of customer behaviours, interests, and preferences to providing refined predictions about their needs and improving customer interactions. In addition, AI is employed in developing chatbots that facilitate more effective communication with consumers, thereby improving customer experience and operational efficiency (Soni et al., 2020). In data analytics, AI is crucial for identifying patterns, deviations and opportunities and anticipating future situations, significantly improving business decision-making.

Within artificial intelligence, Machine Learning (ML) is particularly relevant. This discipline focuses on developing algorithms that learn from data and improve performance through experience. ML algorithms are continuously refined with training data designed to address specific problems, enabling applications in diverse sectors such as credit evaluation, speech and image recognition, recommendation analysis, and natural language processing (Ramdani et al., 2021; Janiesch et al., 2021).

3.1.3. Cloud computing

Cloud computing is a technological paradigm that redefines how organisations access and manage computing resources. This model offers information technology services over the Internet, allowing users to store files, use software and process data remotely, anytime,

anywhere (Avram, 2014). According to Buyya et al. (2009), cloud computing is conceptualised as a distributed, parallel computing system composed of a network of interconnected, virtualised computers. These computers are dynamically provisioned to present themselves as one or more unified computing resources, operating under service level agreements (SLAs) negotiated between providers and consumers.

The implementation of cloud computing in the enterprise environment translates into multiple benefits. These include cloud data storage and remote access that provides significant operational flexibility. In addition, cloud computing offers considerable cost reductions by reducing the need to invest in physical infrastructure, which optimises the economy of space and resources (García Revilla, 2021). Another highlight is improved security and collaboration capabilities, allowing users to keep their data secure and facilitating access to third parties for viewing and editing information.

From a financial perspective, this technology eliminates the need for significant upfront capital investments, allowing companies almost instantaneous access to advanced hardware resources, which can significantly accelerate their business operations (Avram, 2014).

However, the use of cloud computing has its challenges, especially in terms of ethical and privacy issues. The management of information in the cloud must carefully consider privacy and confidentiality implications, as the centralisation of data may increase the risks of security breaches. In the current context, where privacy is becoming an increasingly pressing concern, it is crucial to address these ethical dilemmas proactively to protect data integrity and user privacy (Santi, 2016; González Arencibia & Martínez Cardero, 2020).

In summary, while cloud computing offers transformative business opportunities, it also requires meticulous consideration of ethical and security issues to maximise its benefits and minimise potential risks. This duality between capability and caution defines the context in which organisations must operate in the digital age.

3.1.4. Big Data & Analytics

Integrating Big Data and data analytics allows organisations to handle huge volumes of information and extract meaningful insights that inform strategic decision-making. According to Plugge et al. (2010), Big Data is a set of tools, technologies and procedures that enable organisations to generate, manipulate and manage large volumes of data and storage systems (Plugge et al., 2010). Big Data makes it easier for companies to manage data generation's variety, volume and velocity efficiently. This technology helps manage the overwhelming amount of information and transforms it into actionable knowledge, thus optimising business processes (Sagiroglu & Sinanc, 2013).

Data analytics focuses on exploring large sets of information across multiple categories, aiming to uncover patterns and trends that can bring tangible benefits to the organisation. This practice enables companies to gain competitive advantages over their rivals while maintaining a prominent position in the market. With the support of these technologies, companies can improve interaction with customers and deepen market analysis, offering products and services that better align with the specific needs of their consumers (Camargo-Vega et al., 2015).

3.1.5. Blockchain and Cryptocurrency

Blockchain technology, or blockchain, is a peer-to-peer network that maintains a shared, unalterable and decentralised accounting record, providing a highly reliable environment for transactions (Col, 2022; Lu et al., 2023). This technology is widely used for developing and hosting cryptocurrencies, an area that is rapidly expanding (Ahmed Alamer, 2023).

Despite its close relationship with Big Data, blockchain faces scalability challenges due to its limited storage capacity, which can complicate the management of large volumes of data. Nevertheless, its application in the business sector is increasingly valued, particularly for its security and confidentiality in handling customer information and the accurate and accessible documentation of business transactions (Elgamal et al., 2023).

Implementing blockchain technology can significantly improve the integrity, confidentiality, interchangeability, transparency and security of data in companies of any size, thereby optimising productivity and supply chain efficiency (Patil et al., 2023).

To understand how it works, it is essential to refer to Distributed Ledger Technology (DLT), which allows transactions to be recorded and managed in a decentralised manner through a network of interconnected nodes. This technological base facilitates the creation of tangible and financial assets, such as crypto assets, and allows the implementation of smart contracts to automate contractual processes (Zapata Sevilla, 2023).

Cryptocurrencies are decentralised digital assets that function like conventional currencies but operate on the Internet without intermediaries. Bitcoin, the most prominent example, uses an encrypted transaction validation system and a decentralised communication network, ensuring direct transactions between users (Díez, 2019).

While cryptocurrencies offer solutions to problems such as exchange rate dependency and centralisation, they also present significant challenges. According to some authors, the ad-vantages of anonymity and the absence of intermediaries can facilitate illicit activities, such as money laundering and trafficking in prohibited goods (Navarro Cardoso, 2019; Saldaña Taboada, 2017).

3.2. Implementation of New Technologies in SMEs

3.2.1. Trends in the current use of technologies

In today's dynamic environment, companies must adapt their organisational practices and structures to respond to continuous change and prepare for future challenges. Although technologies tend to be more prevalent in large companies due to their extensive scale, scope and capacity to invest and manage, this trend is changing (Durst et al., 2024). SMEs are increasingly aware of adopting advanced technologies to foster growth and ensure sustainability in the competitive marketplace (Quero, 2016; Ramdani et al., 2021). This awareness gradually reduces the technology gap between large corporations and SMEs, highlighting a movement towards more significant technological equity in the business world.

According to data compiled by the Government of Spain (Ministry of Economic Affairs and Digital Transformation) in 2022, it is observed that SMEs show varying levels of technological adoption: the presence of Artificial Intelligence (AI) in these companies is around 15%, while the use of Big Data reaches approximately 18%. On the other hand, robotics is less prevalent, with around 9% of SMEs using this technology, and cybersecurity, essential today, is employed by around 89%. As for e-commerce, an industry in constant growth, approximately 30% of SMEs are involved in this type of commerce, representing an increase of 11% compared to 2021.

The European Union has set a target for its Digital Decade: by 2030, at least 75% of European companies should incorporate at least one of the critical technologies, such as cloud computing, AI, and big data. However, according to data from Spain in 2022, the adoption of these technologies stands at 31.8% for Cloud Computing, 13.9% for Big Data and 11.8% for AI, according to the National Observatory of Technology and Society of the Ministry of Economic Affairs and Transformation.

3.2.2. Benefits of Implementing New Technologies

Integrating technological tools automatically gives companies a stronger position in their respective sectors. This approach not only adds value to the company but also to its employees and customers (Silgado, 2021). Using these tools improves control over crucial operations such as planning, organising, directing and controlling, facilitating better business decisions. It contributes to achieving business objectives, competitiveness in the marketplace, and, most importantly, developing higher quality and quantity products and services to meet customer needs (Valecillos & Quintero, 2007).

First, implementing technologies improves operational efficiency by simplifying the acquisition of information and data, making it a quick and enriching task for management (Silgado, 2021). In addition to facilitating massive data collection, these technologies provide companies with more effective learning by allowing easy and personalised access to information and immediate feedback (Casanova, 2022).

In addition, to remain competitive, a company must provide high-quality products and services that outperform its competitors and are favourably perceived by customers. Introducing new technologies in production processes can significantly increase productivity (Acosta et al., 2016). It involves producing above the industry average and fully satisfying the needs of consumers, optimising available resources to reduce operating costs as much as possible (Córdoba Castrillón, 2015).

Improved decision-making and predictive analysis are also crucial aspects for the success of SMEs. Technological innovations play a fundamental role in supporting these functions by allowing more efficient management of the company's resources and services (Acosta et al., 2016). These tools simplify data management, facilitate timely and appropriate decision-making, resolve challenges, and provide a clear vision of monitoring internal processes (Silgado, 2021).

Finally, adopting innovative technologies can significantly expand market reach and im-

prove customer satisfaction. This is achieved by enhancing the company's internal and external communication and increasing collaboration, effectiveness, and customer satisfaction (Vega, 2019). Furthermore, these new technologies can anticipate and forecast trends in various areas, providing companies with a more profound knowledge of their consumers' needs and facilitating the expansion of their target market (Córdoba Castrillón, 2015).

3.2.3. Obstacles and Barriers to the Implementation of Technology in SMEs

Large corporations may appear more inclined towards innovation than SMEs; however, academic consensus underscores innovation's critical importance for the latter's survival and prosperity (Hervás-Oliver et al., 2021; Ramírez et al., 2022). Nonetheless, these companies face various obstacles when opting for new technologies, which may vary depending on their size, stage of development, experience, location, and sector (Hervás-Oliver et al., 2021). Among these challenges are financial constraints and resource scarcity, which may compromise their ability to invest in research and development and adopt new technologies (Ramírez et al., 2022). Additionally, the shortage of technical knowledge and skills in their personnel can hinder the implementation of innovative strategies and adaptation to rapid environmental changes (Ramírez et al., 2022). Data security and privacy concerns also pose significant challenges, as the widespread use of technologies has raised growing concerns about safeguarding personal information and preventing risks such as cyberattacks and fraud (Blume Moore, 2021).

Furthermore, resistance to organisational change, exacerbated by traditional administrative and leadership approaches, as well as by a lack of knowledge about how to manage the necessary changes to align the company with new technologies, can hinder the adoption of advanced technologies such as information systems (Viana, 1999; Valecillos & Quintero, 2007). Resistance to change arises from the imposition in the process and the uncertainty it provokes in people, which can lead to rigid and inflexible behaviours and conflicts in the organisational and de-velopmental environment (Firth, 2000; Valecillos & Quintero, 2007). In this regard, it is essential to implement effective change management strategies that promote an organisational culture receptive to innovation and facilitate adaptation to new technologies through staff training, promotion of participation, and transformational leadership (Firth, 2000; Valecillos & Quintero, 2007; Hervás-Oliver et al., 2021). Additionally, collaboration with academic institutions and support organisations can provide access to specialised resources and knowledge to facilitate adopting and applying new technologies in business (Valecillos & Quintero, 2007; Hervás-Oliver et al., 2021). In summary, while SMEs face various challenges when adopting new technologies, a broad spectrum of strategies and resources are available to overcome these barriers and capitalise on the benefits of technological innovation in the current business environment.

3.3. Legal and regulatory framework

In the continuously evolving digital landscape, the issues of privacy and data protection have gained significant traction in both societal and business realms. Within this context, various pivotal regulations have emerged as cornerstones governing privacy and data management on a global scale. These include the General Data Protection Regulation (GDPR) (EU) 2016/679 and Spain's Organic Law 3/2018 on Data Protection and Guarantee of Digital Rights (LOPD) (Ministry of Science and Innovation, 2023). Additionally, regulations such as the California Consumer Privacy Act (CCPA) and the Data Protection Act in the UK contribute to this regulatory framework (Ministry of Science and Innovation, 2023). These regulations are de-signed to ensure the confidentiality, integrity, and accessibility of personal data while providing clear guidelines for their handling and responsible utilisation. In an era of ubiquitous data collection and processing, compliance with these regulations is more critical than ever, given the substantial implications of non-compliance for individuals and organisations. Thus, recognising such regulations' pivotal role and influence in the contemporary landscape becomes imperative as they address increasingly pertinent actions in an ever-digitalizing world.

The legislative landscape surrounding e-commerce has assumed unprecedented importance in a milieu where online transactions have become integral facets of daily life and global commerce. As e-commerce and online transactions continue to burgeon, the necessity for tailored regulations and laws to address the attendant challenges and opportunities becomes glaringly apparent. Regions across the globe have responded to this exigency by formulating their unique regulatory frameworks and laws aimed at safeguarding the interests

of consumers and businesses alike. Notable examples encompass the UK Electronic Commerce Regulations, the US E-commerce Act, and the EU E-commerce Directive, among a plethora of others (Vera & Oficina Económica y Comercial de la Embajada de Es, 2022; Amandi, 2007). These regulations endeavour to balance consumer protection, online security, and trade facilitation within an ever-evolving digital milieu.

The pivotal role of ethics and responsibility in ensuring that technological advancements are redounded to benefit society cannot be overstated. Artificial intelligence, automation, and data analytics have revolutionised societal interactions, professional landscapes, and daily living. However, this rapid transformation has ushered in a host of ethical quandaries and concerns regarding these technologies' ethical deployment and utilisation. Regulatory measures and ethical frameworks have been developed to guide emerging technologies' judicious and re-sponsible implementation in response to these exigencies. An example in this domain is the EU's forthcoming Ethics Directive on Artificial Intelligence, which aims to provide com-prehensive guidelines for the ethical deployment of AI technologies (European Parliament, 2023). Nonetheless, the pace of technological evolution often outstrips the capacity of regulatory frameworks to keep abreast, necessitating ongoing collaboration among governmental bodies, businesses, academics, and society at large to ensure that emerging technologies are harnessed ethically and responsibly (Olcott Jr, Carrera Farran, Gallardo Echenique, & González Martínez, 2015).

Financing is essential for SMEs to leverage benefits from new technologies fully. This resource provides monetary support and constitutes a crucial strategic investment for developing, implementing, and maintaining innovative technological solutions. It is critical to consider that the particularities of each business, such as its size, financial needs, current resources, and ability to manage costs and risks, determine the access to different financing methods (Cassar, 2004).

Younger SMEs, for example, tend to rely less on external financing sources, instead opting for internal resources and short-term debt. In contrast, more mature SMEs often use various financial instruments. Small businesses, facing restrictions in generating internal revenue and limited capacity to issue shares, typically depend more heavily on bank loans (Moritz et al., 2016).

Furthermore, it is essential to highlight the influence of the economic environment and government policies on the availability and conditions of these financing options. Fluctuations in interest rates, credit policies, and incentive programmes can significantly alter the accessibility and attractiveness of different types of financing. For instance, tax incentives for technology investment can encourage SMEs to seek external financing to expand and modernise.

Obtaining financial support is a constant struggle for many businesses, although large enterprises present fewer problems in this respect, while SMEs often face these challenges much more frequently. The lack of funding is a barrier that can hinder the innovation and growth of SMEs. According to a study by Kumar and Rao, several significant barriers stand in the way of incorporating new technologies in SMEs (Kumar & Rao, 2015; Blach et al., 2020). The supply gap implies the limited availability of funds designated for SMEs, as financial institutions are often reluctant to finance these businesses. The demand gap refers to the discrepancy between the amount of financing that SMEs need and the amount available.

In contrast, the benevolence gap shows that some financial institutions may not be willing to finance SMEs. Moreover, the knowledge asymmetry gap highlights that SMEs may lack information and knowledge on how to access suitable sources of financing for their needs; on the other hand, it is noteworthy that the company will have more information about its product and its projection expectations than potential investors. However, it is essential to note that once the entrepreneur successfully demonstrates the viability of a profitable opportunity, it is typical for the business's financing needs to experience a significantly positive change (Shane, 2009).

Additionally, the adoption of advanced technologies requires not only capital but also strategic planning and effective management. Staff training and adapting business processes are essential to maximise the benefits of technological investments. Therefore, SMEs must con-sider these additional factors when planning their financing and technology growth strategies (Moritz et al., 2016).

Government entities and public financial institutions offer a variety of financing pro-grammes to support SMEs. These programmes may include preferential loans, short-term bank financing, credit lines, and loan guarantees specific to innovation, representing the

current primary source of funding for SMEs. However, the cost of capital remains high, particularly in the SME sector, where it faces an average cost of approximately double that of large enterprises. Regarding public financing, in Spain, the CDTI-E.P.E. is a Public Business Entity operating under the Ministry of Science and Innovation's mission to stimulate innovation and techno-logical advancement in the Spanish business sector. This entity is crucial in managing support and financial assistance applications for Spanish companies' research, development, and in-novation (R&D&I) projects (Ministry of Science and Innovation, 2023).

The government is also a relevant capital provider, granting subsidies and tax exemptions and promoting support for high-risk and large-scale projects. This entity encourages aid to SMEs as they recognise the significant influence that SMEs have on the economy and growth of their country (Baker & Welter, 2014)—according to a study conducted by Alexandra Moritz, a high percentage of SMEs in the study used short-term financing. This included bank overdrafts, credit card overdrafts, lines of credit (34.8%), and commercial credit (29.8%). On the other hand, 25.3% resorted to bank loans (Moritz et al., 2016).

Moreover, economic aid or grants are resources provided by government institutions, foundations, or non-profit entities to support specific projects or business activities. SMEs can use these funds for research, development, expansion, and other strategic actions. It is essential to highlight that, on many occasions, the repayment of these economic aids is not required (Moritz et al., 2016; Scholtens, 1999).

Private investors, also known as "business angels," are generally wealthy individuals who invest their capital in start-ups or growing companies in exchange for an equity stake. These investors bring capital, expertise, and networking opportunities to SMEs (Scholtens, 1999). Venture capital is a group of specialised financial intermediaries that finance SMEs. This group acts on behalf of its shareholders and invests in companies with high growth potential in ex-change for an equity stake. Their primary function is to understand the risks associated with specific companies, such as new or emerging ones, and specific economic sectors, such as high technology (Scholtens, 1999; Baker & Welter, 2014).

Crowdfunding and collective financing are terms used interchangeably to define the practice of obtaining financing from many people to support a project or company. However, there is a slight difference between the two concepts. Collective financing involves any form of financing that involves a group of people contributing funds, while crowdfunding, as the name suggests, is a financing model where many investors contribute small amounts of money to support a project in exchange for a reward or a stake in the project or company (Sanchez-Riofrio, 2018; Roig-Tierno et al., 2015).

4. Conclusions

This work aims to analyse in detail the crucial importance of innovation in SMEs, highlighting how these innovative activities act as catalysts for growth and competitiveness in the contemporary market. During this final degree project, we applied a systematic literature review methodology, selecting and evaluating various academic studies and examples of business success. This approach has allowed us to discern critical trends, identify effective strategies and recognise recurring challenges that SMEs face in their efforts to innovate. By integrating these findings, our research provides a comprehensive view of how innovation, when properly implemented and managed, can serve as a transformative driver for SMEs, driving their economic success and contributing to sustainable economic development and resilience in a constantly changing business environment.

It is essential to recognise that the strategic relevance of technological innovation in SMEs is decisive since it constitutes an essential engine of growth and competitiveness. Incorporating advanced technologies, ranging from automation solutions to artificial intelligence platforms and data analysis, can radically revolutionise the business models of these companies. This transformation significantly improves operational efficiency and resource optimisation, generates new market opportunities, and enables SMEs to compete globally. The effective integration of technological innovations is crucial for adaptation to a dynamic business environment, improving the ability to respond to changing market demands and new consumer trends.

On the other hand, our conclusions emphasise the importance of recognising and analysing the specific challenges that small and medium-sized enterprises (SMEs) face when implementing technological innovations. One of the most significant obstacles is financial restriction; SMEs often operate on limited budgets, which makes it challenging to invest in

advanced technologies, which can be financially demanding. Additionally, the need for more specialised human resources presents another considerable challenge. Many SMEs need more qualified personnel to develop, implement and manage advanced technological solutions, which is essential to capitalise on the benefits of innovation effectively.

Another significant barrier is culture. In many SMEs, there is resistance to change where traditional practices are deeply entrenched, resulting in a reluctance to adopt new technologies despite their potential benefits. Finally, SMEs often need help in scale and scope when trying to innovate. The ability to scale technology solutions and adapt them to the specific needs of an SME can be complex and require careful planning and strategy.

It is equally crucial to highlight how successful implementation of technological innovations can significantly catalyse productivity and operational efficiency. Integrating new technologies into business processes allows SMEs to automate routine tasks, reduce errors and optimise the use of time and resources. Adopting customer relationship management (CRM) systems and enterprise resource planning (ERP) solutions can significantly improve internal coordination, data-driven decision-making, and efficient supply chain management. Additionally, digital technology opens paths to new business models, such as e-commerce, that can expand market reach and improve customer interaction. Data analytics tools and artificial intelligence offer SMEs the ability to understand market trends and consumer behaviour patterns better, thereby facilitating more informed and strategic decision-making.

Additionally, it is essential to address the ethical and security considerations that accompany the implementation of new technologies. Data privacy and security emerge as crucial aspects in today's digital era. When adopting innovative technologies, SMEs must ensure that data collection, storage and use are carried out ethically and according to current regulations. This involves implementing robust cybersecurity systems to protect against data breaches and cyber-attacks, which can have severe financial consequences and damage the company's reputation.

Beyond legal compliance, a moral imperative is to protect customers' personal information. SMEs should adopt a stance of transparency in their data management practices, clearly communicating to customers how their data is used and obtaining explicit consent. This transparency and diligence in managing data privacy and security not only fulfills an ethical obligation but is also essential to building and maintaining the trust of customers and business partners.

In concluding this analysis of innovation in SMEs, it is imperative to look to the future and offer practical recommendations for those companies seeking to embark on technological innovation initiatives. SMEs must adopt an open and proactive mindset towards innovation, ensuring they are constantly updated on new technologies and market trends. It involves adopting emerging technologies, continuously training staff, and reviewing business processes to ensure their alignment with current technological solutions. Technologies such as artificial intelligence, the Internet of Things (IoT) and automation are anticipated to advance further, offering new opportunities for SMEs to improve their operational efficiency and create new value propositions. Furthermore, the growing importance of sustainability and corporate social responsibility could lead SMEs to innovate in technology and sustainable business practices. Therefore, SMEs should consider not only how they can implement current technology but also how they can prepare for future waves of innovation. It includes establishing a culture of learning and adaptability, investing in research and development, and seeking strategic collaborations to expand its innovation capacity. By doing so, SMEs will not only be able to keep up with the rapid pace of technological change but also play a vital role in shaping the future of the business landscape.

The literature review reveals that technological innovation is a critical factor for the growth and competitiveness of SMEs in today's market. Despite significant challenges, such as financial constraints and a lack of specialised human resources, implementing innovative technologies can radically transform business models, improve operational efficiency and open up new market opportunities. It is clear that SMEs that adopt a proactive mindset towards innovation, invest in continuous staff training and keep up with emerging technologies will be better positioned to navigate the rapidly changing business environment and contribute to sustainable economic development.

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