



Challenges and adaptation of the integration of digital tools in small and medium-sized businesses

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Abstract

This research analyzes the challenges and adaptation strategies faced by small and medium-sized businesses (SMEs) in the integration of digital tools. The main goal is to understand how these companies handle digital transformation, the specific obstacles they encounter, and the successful practices they employ to overcome these challenges. Quantitative research was carried out with a cross-sectional design. Structured questionnaires in digital format distributed through Google Forms were used. The study population included SMEs active in the use of digital tools and the sample was selected through simple random sampling, covering approximately 100 SMEs. The questionnaires were validated, and their reliability evaluated through pilot tests. The results of the survey indicate that 51.85 % of respondents hold other positions within the company, suggesting an organizational structure with diverse roles. 59.26 % consider digitalization to be "very important" for the long-term success of their companies. Additionally, 37.04 % of companies have implemented digital marketing tools, improving business operations and customer relationships. Respondents also reported a positive experience with the implementation of digital tools, with 51.85 % evaluating it as "very positive." The research concludes that companies that successfully integrate digital tools report improvements in operational efficiency, customer satisfaction, and market expansion. Therefore, it is essential that SMEs develop effective strategies to overcome the obstacles and take advantage of the opportunities that digitalization offers.

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Introduction

The integration of digital tools in small and medium-sized businesses (SMEs) is a topic of growing interest in contemporary literature due to its significant impact on business competitiveness and sustainability. SMEs, by adopting digital technologies, can improve their operational efficiency, optimize resource management and expand their reach in the global market (Chimucheka & Mandipaka, 2015; Bokša *et al.*, 2020) ^[5, 3]. However, this digital transition is not without challenges, as many companies must overcome technological, organizational and environmental barriers to achieve effective integration (Rahman, 2022) ^[17].

The current relevance of digitalization in SMEs is highlighted in numerous studies that analyze the opportunities and obstacles that these companies face. The adoption of digital platforms and emerging technologies, such as the Internet of Things (IoT) and artificial intelligence, has been identified as a key factor for business success in the digital era (Moeuf *et al.*, 2018; Cenamor *et al.*, 2019) ^[13, 4]. However, the lack of financial and human resources, along with resistance to organizational change, are recurring challenges that hinder the full implementation of these technologies (Nadkarni & Prügl, 2020; Jensen *et al.*, 2016) ^[14, 9].

In addition to the challenges, adaptation strategies are crucial for SMEs to benefit from digitalization. Training and developing digital competencies among employees, as well as inter-organizational collaboration and the use of digital platforms to share knowledge, are essential approaches to overcome existing barriers (Klewitz & Hansen, 2014, 2020; Wong *et al.*, 2011) ^[10, 19]. Recent studies suggest that greater digital connectivity can improve relationships in the supply chain and facilitate continuous innovation within SMEs (Porter & Heppelmann, 2014; Rahman, 2022) ^[16, 17].

SME digitalization is a complex process that requires a multifaceted approach to address the various challenges and take advantage of the opportunities it offers. The literature indicates that, although the barriers are significant, appropriate adaptation strategies can transform these obstacles into sustainable competitive advantages (Cenamor *et al.*, 2019; Bokša *et al.*, 2020) ^[4, 3]. It is therefore essential that SMEs develop a deep understanding of the factors that influence the integration of digital tools to ensure their long-term success in an increasingly digitalized business environment.

Analysis of the existing literature on the digitalization of small and medium-sized enterprises (SMEs) reveals several gaps that this research aims to address. Although significant studies have been conducted on the adoption of digital technologies in SMEs, most focus on the benefits and opportunities, leaving the specific challenges and adaptation strategies necessary for the effective integration of these tools insufficiently explored (Cenamor *et al.*, 2019; Dumcius & Skersys, 2019) ^[4, 6]. Furthermore, much research focuses on large corporations, limiting the applicability of its findings to SMEs, which have significantly different structures and resources (Eller *et al.*, 2020) ^[7].

Reviewing previous work, it is observed that, although there is research on digitalization in SMEs, it often does not exhaustively address the specific challenges faced by smaller companies, nor the adaptation strategies that could be more effective for them. Studies such as those by Bagheri *et al.* (2019) ^[2] and Genc *et al.* (2019) ^[8] provide an overview of opportunities and barriers but lack a detailed focus on the adaptation phases and practical experiences of SMEs during the implementation of digital technologies.

These gaps in the literature limit the current understanding of how SMEs can effectively overcome the obstacles they encounter during digitalization. The lack of research focused on the challenges and specific adaptation strategies can lead to an underestimation of the support and resource needs that these companies require to compete in a digital environment (Adam & Alarifi, 2021; Matarazzo *et al.*, 2021) ^[1, 11]. Without a deep understanding of these aspects, supporting policies and programs may not be appropriate or effective.

Therefore, there is a justified need for a systematic and up-to-date synthesis of literature that specifically addresses the challenges and adaptation in the integration of digital tools in SMEs. This review aims to fill this gap by providing a detailed and contextualized assessment of the barriers faced and success strategies, thereby contributing to the existing body of knowledge and providing practical recommendations for researchers, entrepreneurs and policymakers (Verdeš *et al.*, 2024) ^[18].

The main objective of this research is to identify and analyze the challenges and adaptation strategies faced by small and medium-sized businesses (SMEs) in the integration of digital tools. The research focuses on understanding how these companies manage digital transformation, the specific obstacles they encounter, and the successful practices they employ to overcome these challenges. This study aims to provide a detailed framework that can be used by other SMEs to improve their digitalization process and increase their competitiveness in the global market.

Identify the key challenges in the integration of digital tools in SMEs: This objective focuses on recognizing the most common barriers that SMEs face during the digitalization process, such as financial limitations, resistance to change, lack of digital skills, and problems of technological infrastructure (Eller *et al.*, 2020; Bokša *et al.*, 2020) ^[7, 3].

Explore the adaptation strategies and best practices used by SMEs to overcome these challenges: This objective seeks to investigate how SMEs have adapted their strategies to incorporate digital tools effectively. This includes case studies of companies that have achieved successful integration, as well as an analysis of the policies and practices that have facilitated this process (OECD, 2021; Martínez-Peláez *et al.*, 2024) ^[15, 12].

Methodology

This research was carried out with a quantitative approach, using a cross-sectional design. Material resources were used such as structured questionnaires in digital format, distributed through Google Forms, with respect to technical resources, digital platforms were used for data collection and SPSS software was used for data analysis, guaranteeing efficiency and organization. of the answers.

The study population included SMEs active in the use of digital tools, and the sample was selected through simple random sampling, covering approximately 100 SMEs. The inclusion criteria were: being owners or workers of SMEs, having at least one year of experience in the implementation of digital technologies, and being willing to voluntarily participate in the study.

The operationalization of these variables was carried out through a questionnaire divided into sections: socio-demographic information, perception of the importance of digitalization, current use of digital tools, experience with digital tools, and challenges faced.

To collect data, a structured questionnaire in Google Forms was used, distributed through professional networks and business associations. The verification guide included specific criteria to standardize data collection and ensure the reliability and validity of the results obtained. The questionnaires were validated, and their reliability was evaluated through pilot tests. The progress of the survey was monitored to ensure the scope of the proposed amount, during data analysis, cleaning was carried out to eliminate duplicate, inconsistent or irrelevant responses, and a descriptive analysis was performed to obtain basic statistics. Trends were identified in the responses according to different segments. Data preparation included numerical coding into percentages to facilitate interpretation, and secure storage of responses in an organized database.

Results

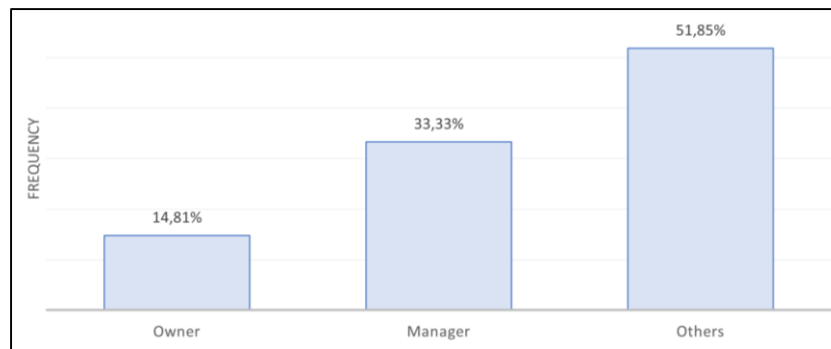


Fig 1: Position in the company

The survey results indicate that 51.85 % of respondents hold other positions within the company, suggesting an organizational structure with a greater number of employees in diverse roles compared to ownership or direct supervisory

positions. This reflects a hierarchical distribution in which operational and specialized roles predominate, in contrast to the 33.33 % who hold managerial positions and 14.81 % who are owners.

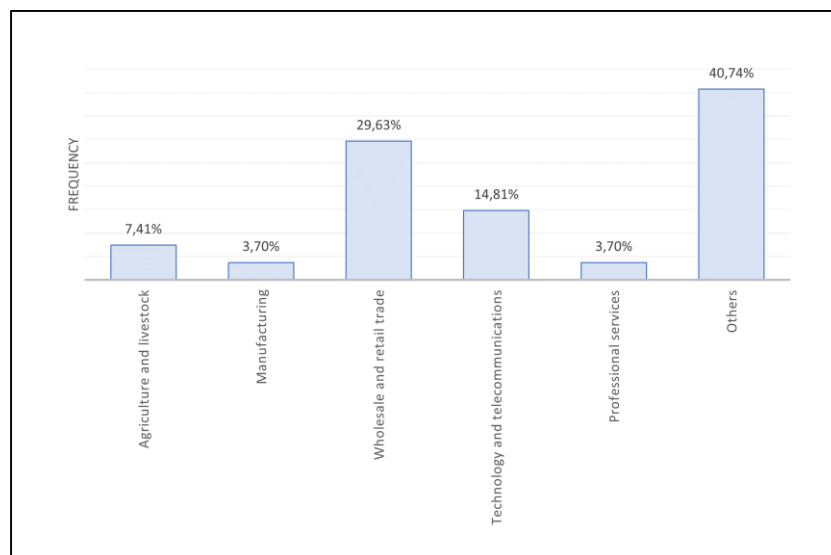


Fig 2: Company sector

The companies surveyed operate in a variety of sectors, with 40.74 % belonging to diverse categories outside of the specified options. This result highlights the diversity of the business landscape and underlines the importance of considering industry-specific factors when analyzing business trends and making strategic decisions. The

significant representation of sectors such as wholesale and retail trade (29.63 %) and technology and telecommunications (14.81 %) also suggest that digitalization and technological tools are widely valued in different industrial contexts.

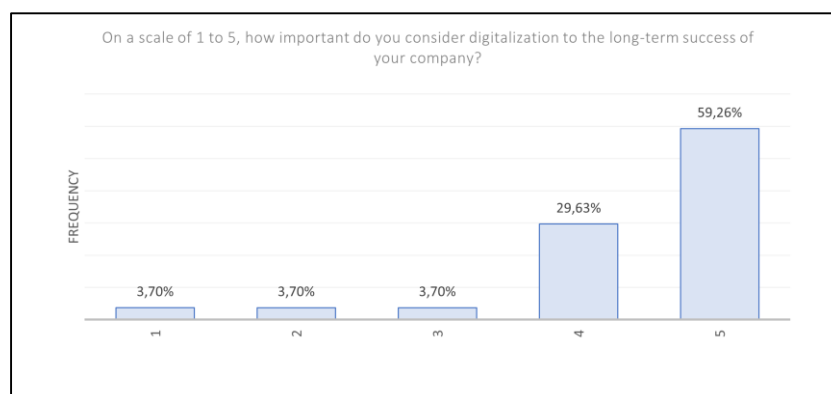


Fig 3: Importance of digitalization

The majority of respondents (59.26 %) consider digitalization to be "very important" for the long-term success of their companies, while 29.63 % value it as "important." These results reflect a strong recognition by companies of the crucial importance of digital transformation in a competitive

environment. This trend suggests that the adoption of digital technologies is not only seen as a strategic advantage, but as a fundamental necessity to ensure sustainability and future growth in today's market.

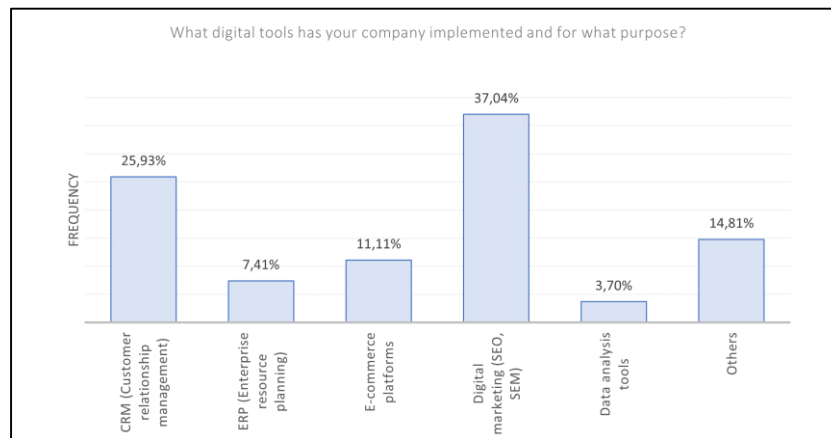


Fig 4: Implementation of digital tools

The graph highlights that 37.04 % of companies have implemented digital marketing tools (SEO, SEM, social networks). This dominance suggests that digital marketing tools are critical to improving business operations and customer relationships. In addition, they allow companies to

strategically position themselves in the market, which contributes to sustained success in the digital age. This significant adoption reflects the perception that digital marketing is crucial to maintaining competitiveness and achieving long-term business goals.

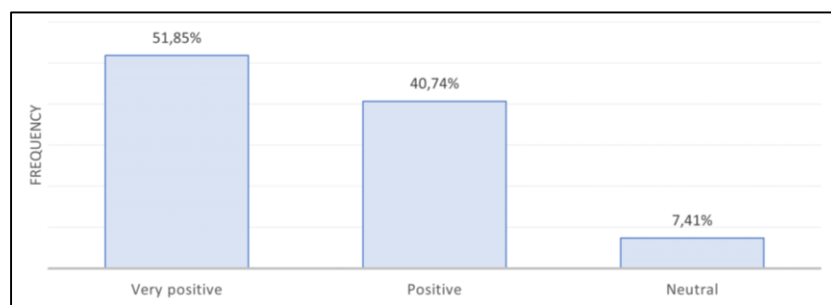


Fig 5: Implementation experience

The results of the survey are satisfactory, given that 51.85 % of respondents evaluated their experience as "Very Positive", 40.74 % as "Positive" and 7.41 % as "Neutral". This indicates that the majority of respondents have had a favorable

experience with the implementation of digital tools. In this way, it can be deduced that companies perceive significant value in the adoption of digital solutions to improve their operations and processes.

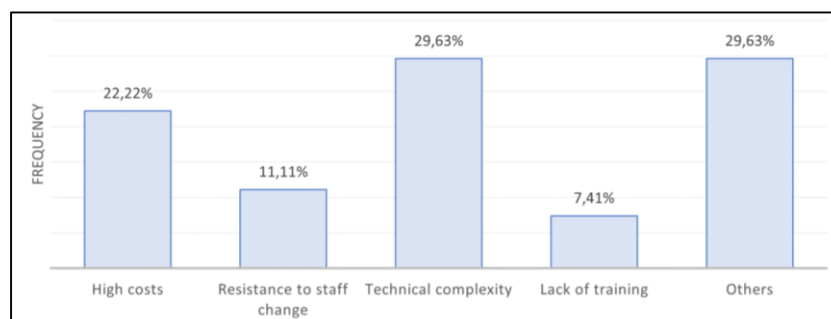


Fig 6: Challenges and obstacles in the integration of digital tools

The results of the survey are satisfactory, evidencing a high complexity in the use of digital tools. This is reflected in the fact that 29.63 % of those surveyed say they face significant difficulties in this area. These findings indicate that this

problem is prevalent in emerging businesses, such as small and medium-sized enterprises (SMEs). However, a decreasing trend is observed in the frequency of these problems over time.

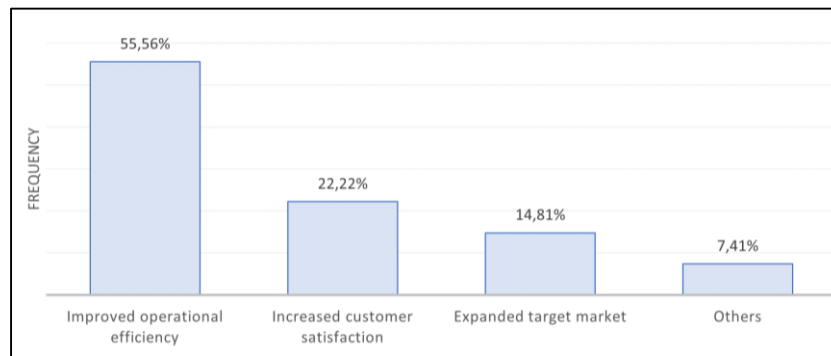


Fig 7: Benefits of digital tools

The results of the survey are satisfactory, since 55.56 % of respondents indicated that "Improvement in operational efficiency" is a positive result after the implementation of digital tools. Likewise, 22.22 % reported an "Increase in customer satisfaction" and 14.81 % indicated the "Expansion of the target market" as tangible benefits derived from the adoption of these tools. These findings highlight that the implementation of digital tools not only improves operational efficiency, but also increases customer satisfaction and expands market reach. Together, these results demonstrate the positive impact of digital transformation on various aspects of business performance.

Discussion

The main objective of this research is to identify and analyze the challenges and adaptation strategies faced by small and medium-sized businesses (SMEs) in the integration of digital tools. The research focuses on understanding how these companies manage digital transformation, the specific obstacles they encounter, and the successful practices they employ to overcome these challenges. This study aims to provide a detailed framework that can be used by other SMEs to improve their digitalization process and increase their competitiveness in the global market.

SMEs often face financial and resource challenges when trying to integrate digital tools. Lack of capital and limited investment capacity in advanced technologies significantly restrict their ability to adopt and adapt to new digital tools (Eller *et al.*, 2020; Bokša *et al.*, 2020) ^[7, 3]. Furthermore, the lack of human resources trained in digital technologies translates into an additional barrier, since many SMEs cannot afford to hire technology experts (Rahman, 2022) ^[17]. This financial and human resource deficit limits its ability to compete in an increasingly digitalized and technologically advanced market.

Resistance to change within the organizational structures of SMEs also emerges as a significant challenge. The adoption of new technologies involves a cultural transformation that many employees and business leaders may find intimidating (Nadkarni & Prügl, 2020) ^[14]. This resistance is manifested in the reluctance to abandon traditional processes and distrust in the effectiveness of new technologies (Jenson *et al.*, 2016) ^[9]. The lack of an organizational culture open to change can delay the effective implementation of digital tools and hinder innovation.

Despite the challenges, SMEs that successfully integrate digital tools report numerous benefits, such as improved operational efficiency, increased customer satisfaction, and expansion of the target market (Martínez-Peláez *et al.*, 2024) ^[12]. These companies can optimize their internal processes

and improve the quality of their services, which positions them better in the current competitive market (Cenamor *et al.*, 2019) ^[4]. Furthermore, digitalization allows for greater flexibility and responsiveness to market demands, facilitating continuous innovation.

Finally, a comprehensive framework for sustainable digitalization can offer SMEs clear guidance to implement responsible digital practices (Martínez-Peláez *et al.*, 2024) ^[12]. This framework should include the definition of clear objectives, the participation of stakeholders, the creation of sustainable models and the execution of projects with a focus on sustainability. Adopting a holistic approach not only facilitates the integration of digital technologies, but also ensures that these changes contribute positively to the sustainable development of SMEs.

Conclusions

The present research reveals that SMEs face significant financial challenges when trying to integrate digital tools. Lack of capital and limited investment capacity in advanced technologies restrict their ability to adopt and adapt to new digital tools (Eller *et al.*, 2020; Bokša *et al.*, 2020) ^[7, 3]. Furthermore, the shortage of human resources trained in digital technologies exacerbates this barrier, since many SMEs cannot afford to hire technology experts (Rahman, 2022) ^[17]. This financial and human resource deficit limits its ability to compete in an increasingly digitalized and technologically advanced market.

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To overcome these challenges, SMEs must implement effective adaptation strategies, such as continuous training and the development of digital competencies among their employees. Investment in training and development of digital skills is crucial to ensure that staff are prepared to use new technologies efficiently (Klewitz & Hansen, 2014) ^[10]. Furthermore, inter-organizational collaboration and the use of digital platforms to share knowledge are essential approaches that facilitate adaptation and success in digitalization (Wong *et al.*, 2011) ^[19].

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