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DIGITALIZATION OF SMALL AND MEDIUM-SIZED ENTERPRISES IN BULGARIA – A FACTOR FOR THEIR COMPETITIVENESS

Review

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Abstract

Digitalization is a key factor for improving the competitiveness, effectiveness, and sustainability of small- and medium-sized enterprises (SMEs) in Bulgaria. With ever-changing technology, evolving consumer expectations, and increased global competition, SMEs have recognized the use of digital tools has become essential for their growth. This study reveals initial information regarding digitalization implications on Bulgarian SMEs in terms of business transformation or business model innovation in the early stages of the digitalization journey, and highlights the main challenges and opportunities for these businesses in the process of digitalization. Digitalization provides various opportunities for SMEs like access to markets through online sales platforms and/or e-commerce with lower transaction costs and increased access to customers. Cloud services and business process management systems help organizations be more productive internally so they can respond well to the ever-changing landscape of the market. Digital tools engage in innovation, offering better ways to analyze the market, understand customers, and develop customized products and services.” This builds up trust and collaboration among stakeholders, and establishes an efficient business climate in terms of electronic transactions. Yet, in practice, the digital transformation of Bulgarian SMEs is going through enormous hardships. These challenges come in the form of limited qualified personnel, budget restrictions, and disparity in digital infrastructure connectivity between rural and urban cores. A common challenge is that most SMEs neither have a structured digital strategy nor incorporate digital technologies into current business models. That these barriers are holding them back from fully reaping the benefits that digital solutions bring. To address these questions, this study conducted an empirical analysis comprised of expert interviews and a nationwide survey. Interviews with 12 digitalization experts supported essential success factors like management support, tools used and organizational and environmental elements. Through a stratified random sampling technique, 150 SME managers in diverse sectors were surveyed in a time period ranging from January 10 to February 10, 2025, resulting in 114 complete responses. The survey analyzed levels of digital adoption, whether any digital strategies existed, areas of digitalization and impacts on competitiveness. Quantitative data were analyzed through descriptive statistics, factor analysis, and correlations. The results of this study are a guide for SMEs who aim to adopt such digital technologies, policymakers who work for favourable mechanisms, and scholars who



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study digital transformation. The study, by both assessing the context as well as by assessing its inhibitors and facilitators of the digital transformation of SMEs, moreover serves as a key reference for both policy makers and business leaders, as the study offers clear recommendations to create a better environment for SMEs in BG to be more inclusive and better prepared for a better digital transformation.

Keywords: Digitalization, SMEs, Competitiveness

1. INTRODUCTION

Digitalization has become a keystone of sustainable growth, innovation, and competitiveness in today's fast-evolving business landscape. Small and medium-sized enterprises (SMEs) represent a sizeable proportion of national economies, including Bulgaria's, and digital transformation is no longer a choice but a necessity for them. As the world becomes more interconnected and technology evolves at breakneck speed, small businesses have no choice but to embrace digitalisation to streamline efforts, engage with customers and reach new marketplaces. With innovations such as cloud computing, artificial intelligence, business process automation, and e-commerce platforms, digitalization "allows" SMEs to cut through limitations such as limited market access, high operational costs, and inefficient processes. These technologies facilitate the optimization and efficiency of business operations and lower transactional costs, leading to more agile and customer-centric business models. Moreover, digital tools aid forest climate monitoring and visualization and thus deliver new data and information at a lower cost, support better decision making, encourage innovation, enhance trust and transparency through improved data management, and communication to stakeholders.

Three main reasons thresholds for overcoming them are discussed because of which this process in Bulgaria is complicated and uneven despite the promising opportunities arising from digital transformation. Many companies face major challenges including, a lack of financial resources, a lack of employees with digital skills and differences in access to digital infrastructure, especially in urban compared to rural areas. These challenges hinder SMEs' ability to adopt and integrate digital technologies effectively, threatening to expand the digital divide and worsen economic discrepancies in the region. The SMEs in Bulgaria have to wade through in an increasingly dynamic and competitive environment, where a double pressure is created for adaptation to technology and changing consumer expectations. Thus, it requires careful planning, sufficient funding support, and policy interventions to be in place that better encourage inclusive digital development. There is a fundamental gap in the understanding of practical barriers against digital adoption at the organizational level and the structural changes that may be required to mitigate them.

To address this gap, the present study investigates the actual level of digitalization of Bulgarian SMEs and evaluates its implications for competitiveness and sustainability. Employing a mixed-method, empirical study design, the research investigates the internal organizational factors and external environmental conditions that influence the digital transformation process. The study is organized according to clear objectives, such as assessing the effects of digital technology on competitiveness, mapping barriers to adoption, and examining how digital devices can encourage innovation and transparency in business. One is the empirical analysis held in early 2025, consisting of two main elements: expert interviews and a national survey. The expert interviews, which included 12 professionals with deep experience in digital transformation, helped to corroborate critical success factors such as leadership attitudes, technological tools, and external influences. Using a complex random stratified sampling method, the researchers collected quantitative data with a survey consisting of 114 SME managers, on the presence, adoption levels, and perceived impact of the digital strategy. Research of this type is has a wide range of importance, not only for academic purposes. The study offers SME leaders practical insights into how digital adoption can enhance operational efficiency and network effectiveness. For policymakers, it underscores the necessity for targeted support programs that address skills development, funding gaps, and infrastructure disparities. Secondly, the important analytical components

of the study, such as the consideration of both consumption and production aspects of digitalization alongside integrated reporting, i.e., inclusive development, are relevant in relation to the wider discourse of digital equity across regions. Ultimately, the objective of this research is to serve as an evidence-based recommendation to facilitating Bulgaria's shift towards a digital economy in which SMEs can undergo digital transformation more efficiently. Focusing on both the affordances and inhibitors, the article helps map the way to a stronger, bolder, and more sustainable SME sector that is able to not just survive, but to thrive, within a fast-changing economic landscape.

2. LITERATURE REVIEW

SMEs form the backbone of global economies, yet they frequently struggle with adopting digital technologies due to resource limitations, risk aversion, and outdated legacy systems. The collective studies offer various methods for evaluating the digital maturity of small and medium-sized enterprises (SMEs) and exploring the practicality of adopting Industry 4.0 solutions within this industry. This review consolidates findings from multiple studies exploring digitalisation from technological, organizational, financial, and strategic perspectives.

2.1. Digitalization Enablers and Barriers

Kallmuenzer et al. (2024) highlight that SMEs' digitalization success depends on access to appropriate technologies and workforce digital skills. However, risk-averse cultures and legacy systems hinder progress. Similarly, Clemente-Almendros et al. (2024) emphasize the role of managers' education, internationalization, and firm size as critical enablers. Conversely, financial constraints and lack of technological awareness, as discussed by Macias-Aguayo et al. (2023), continue to limit SMEs' digital adoption.

Chen et al. (2024) address barriers specific to the construction sector, developing a framework for assessing and prioritizing these barriers using a decision support model. Their findings suggest that overcoming these obstacles requires tailored strategies that consider industry-specific challenges. Meanwhile, Grooss (2024) takes a pragmatic approach, proposing a low-cost optimization strategy for SMEs in asset management, which focuses on leveraging existing technologies rather than high-tech solutions.

2.2. Digital Maturity and Strategic Implementation

Jeanneret Medina et al. (2024) introduce a digital maturity model (DMM) to help SMEs assess and enhance their digital capabilities systematically. Their study highlights the need for practical guidance rather than mere assessments of maturity levels. Similarly, Palade & Møller (2023) draw parallels between Enterprise Resource Planning (ERP) implementation and digitalisation, extracting key success factors applicable to SMEs' digitalization efforts.

Aghazadeh et al. (2024) explore the moderating effect of digital business model maturity on SMEs' digitalisation, indicating that digital platform capability and resilience significantly impact SME growth. The study underscores the importance of digital maturity in linking resources to business success.

2.3. Internationalization through Digitalisation

Bargoni et al. (2024) systematically review the role of digitalization in SMEs' internationalization, identifying three primary mechanisms: ICT adoption, value chain digitalization, and knowledge acquisition through digital platforms. Their study reveals that digital entrepreneurship fosters new business models and market expansion. Hervé et al. (2022) extend this discussion by emphasizing the role of entrepreneurial behaviours in leveraging digital technologies for international trade.

2.4. Digitalization for Business Performance and Turnaround Strategies

Wang & Bai (2024) examine the role of digitalization in firms' turnaround strategies, finding that internal digitalization enhances retrenchment effectiveness, while external digitalization supports product innovation. Their findings suggest that firms undergoing decline can utilize digitalisation as a strategic lever for recovery.

Costa Melo et al. (2023) integrate sustainability dimensions into digitalisation performance evaluations. Their study advocates for an inclusive assessment approach encompassing environmental, social, and economic factors. This aligns with Kozina (2022), who explores digitalization's potential for sustainable business practices, particularly in European SMEs.

2.5. Future Research Directions and Policy Implications

Several studies identify gaps and future research directions. Zhang et al. (2022) call for further exploration of the interaction mechanisms between technological, organizational, and environmental factors in SMEs' digitalisation. Yuleva-Chuchulayna (2021) highlights the need for better policy support and regulatory frameworks to aid SMEs' digitalization, particularly in emerging markets.

Moreover, Costa Melo et al. (2023) emphasize the need for a standardized definition of SMEs in digitalisation research, proposing sectoral and regional studies for better-targeted interventions.

2.6. Previous research

Genest and Gamache's (2020) research identifies key conditions for preparing small and medium-sized manufacturing enterprises (SMEs) for the impending digital revolution. They state that the first step is in creating good business practices to improve manufacturing agility. Moreover, for Industry 4.0, access to real-time production data is essential to adapt adequate technological solutions. This also requires a high-speed Internet connection. Moreover, the research highlights that training staff is an important component as well. The two key elements identified – internet infrastructure and qualified personnel – are necessary for the digitalization associated with implementing Industry 4.0 solutions.

In another contribution Pirola et al. (2020) proposed a complete model that aims to evaluate the digital readiness of Italian SMEs. Their research, which applied that model to 20 companies, evaluated digital maturity across four areas: strategy; personnel; processes; and technology integration. Although the dimensions formalized here are a significant step forward, it is important to note the small sample size.

Brozzi et al. (2021) provided a self-assessment tool for small to medium enterprises (SMEs) to evaluate their individual levels of digital readiness, ranking it as low, medium, or high. This approach is based on a handful of key readiness indicators (KRI) relating to strategy, technology needs, digital knowhow and employee skills. A major advantage is the entire set of KRI indicators.

This paper advocates rethinking Industry 4.0, with a focus on the particularities that small and medium enterprises (SMEs) require. These emphasize the obstacles created by inadequate skilled personnel and a poor grasp of Industry 4.0 related principles that hinder SMEs' digitalization. A significant aspect of their results include the delineation of roadblocks that preclude the adoption of Industry 4.0 structures in these companies.

With respect to the digital maturity assessment, Cognet et al. (2019) proposed a dual-model framework, known as the IMPULS and PwC models, to measure this effect, involving a few steps and providing a pragmatic comparison of different research methods.

The collect studies present a wide range of approaches to assess the digital maturity of SMEs and examine the potential feasibility of implementing Industry 4.0 solutions in this sector.

3. METHODOLOGY

3.1. Problem Statement

The digitalization of small and medium-sized enterprises (SMEs) in Bulgaria is a crucial driver for enhancing competitiveness, improving efficiency, and ensuring long-term sustainability. However, despite its potential benefits, the adoption of digital solutions among SMEs remains a significant challenge due to various barriers.

A major challenge is the lack of skilled professionals with essential digital expertise. Many SMEs face difficulties in hiring and retaining employees who are proficient in emerging technologies, which hinders their ability to successfully adopt and manage digital transformation. Additionally, financial constraints pose a considerable challenge, as many businesses lack the resources to invest in digital tools, cloud services, and automated systems.

Another key issue is the uneven technological development across urban and rural areas. While urban-based SMEs have better access to digital infrastructure, rural businesses often face connectivity issues and limited technological adoption, exacerbating regional economic disparities. This digital divide hinders equal access to market opportunities, innovation, and competitiveness.

Furthermore, SMEs face difficulties in integrating digitalization into their existing business models. Many lack a clear strategy for digitalisation and struggle with the complexities of adapting to rapidly evolving consumer demands, technological advancements, and global competition.

Without adequate support mechanisms such as government policies, financial incentives, and specialized training programs, these challenges may continue to obstruct SMEs from fully leveraging digitalization. Addressing these barriers is essential for fostering a more competitive and innovative business ecosystem in Bulgaria.

This study seeks to analyse the key challenges and opportunities associated with SME digitalization in Bulgaria and propose effective strategies to support their successful digitalisation.

3.2. Research Objectives

The primary aim of this research is to assess the current level of digital adoption among SMEs and to identify the key drivers and inhibitors that affect their digitalisation. Specific objectives include:

To evaluate the effects of digitalization on the competitiveness and long-term sustainability of SMEs in Bulgaria.

To identify the key challenges and barriers faced by SMEs in adopting digital technologies.

To evaluate the role of digital tools such as e-commerce, cloud services, and business process management systems in improving business efficiency.

To analyse the influence of digitalization on innovation, market expansion, and business transparency among SMEs.

To strategic initiatives that can support SMEs in their digitalisation journey.

3.3. Significance of the Research

The results of this research are important for multiple stakeholders, including business owners, policymakers, and researchers, as digitalization continues to shape the future of SMEs in Bulgaria.

For SMEs, this research provides critical insights into the benefits of digital adoption, helping them understand how technology can enhance efficiency, reduce costs, and expand their market reach. The study also identifies key barriers to digitalization, equipping businesses with the knowledge to address these challenges strategically. By highlighting the potential for increased productivity and improved customer engagement through digital tools, SMEs can gain the confidence to invest in new technologies and remain competitive in an evolving market environment. Additionally, this study will provide recommendations on best practices for SMEs to successfully integrate digital solutions while mitigating associated risks.

For policymakers, the study offers valuable data on the current state of SME digitalization, regional disparities, and the necessary policy interventions to support digitalisation. Understanding the financial and skill-related challenges faced by SMEs will help in the formulation of targeted initiatives, such as funding programs, digital training, and improved infrastructure. Policymakers can use these insights to design regulatory frameworks that encourage digital adoption and provide incentives for SMEs to transition towards more technologically advanced business models. Furthermore, government agencies can leverage the findings to enhance public-private partnerships and create a supportive ecosystem that fosters digital innovation within the SME sector.

From an academic standpoint, this research adds to the expanding field of knowledge on digitalisation in SMEs, particularly in the context of Bulgaria. It provides a foundation for future research on digital adoption strategies, best practices, and the long-term impact of digitalization on business growth and sustainability. Academics and researchers can use this study to explore emerging trends, develop theoretical models, and analyse the effects of digitalization in various economic sectors. Additionally, the study can serve as a resource for higher education institutions aiming to design curriculum and training programs that align with the evolving needs of SMEs in the digital age.

Moreover, this study has broader societal implications by shedding light on how digitalization can drive economic growth, job creation, and overall business resilience. As SMEs play a crucial role in local economies, their successful digitalisation can lead to increased employment opportunities, higher productivity, and improved service delivery. By addressing the digital divide between urban and rural SMEs, the study also aims to promote more equitable economic development across different regions of Bulgaria.

By addressing the challenges and opportunities of SME digitalization, this study aims to facilitate a smoother transition toward a more technologically advanced and competitive business environment in Bulgaria. The insights gained will help in shaping a more inclusive and digitally empowered economy, where SMEs can thrive, innovate, and contribute to sustainable national growth.

3.4. Methodology of the Empirical Study

The methodology of this empirical study presents the stages and individual actions in their implementation. It is described sequentially what steps the study goes through and what elements it covers.

The main goal of the empirical study is to establish the level of digitalization, and more specifically, the level of digital transformation in the studied organizations, and how it affects their competitiveness.

In this regard, the main tasks of the study are:

- To establish the level of digitalization and the presence of a digital strategy.
- To determine the areas of digitalization.
- To assess the impact of digitalization on the competitiveness of the studied SMEs.
- To establish the digital competencies, skills, and roles of employees.

Subject, object, and scope of the study

The subject of this study is SMEs operating in the territory of various spheres of activity.

The objective of the study is to establish the impact of digitalization on the level of competitiveness of organizations.

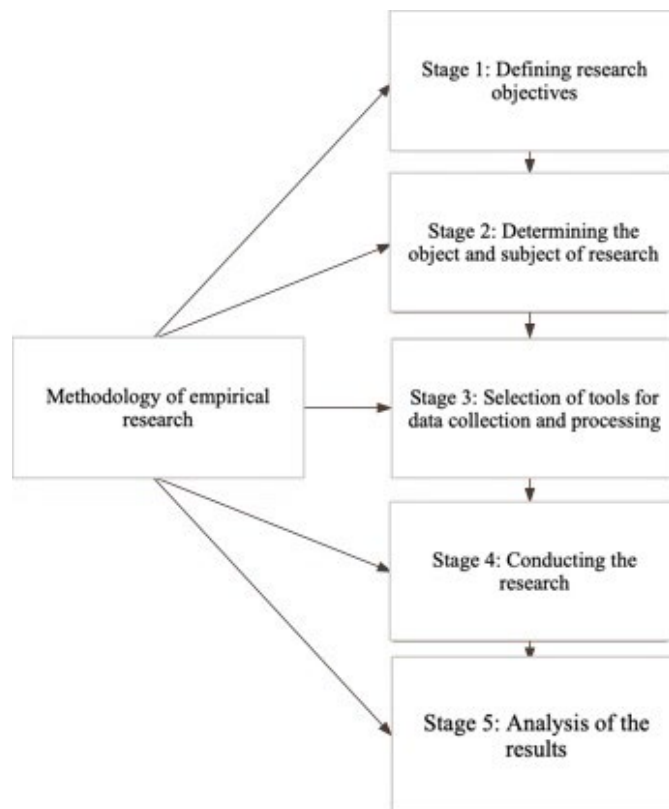


Figure 1 Stages of research

The study is divided into two parts. The first part includes interviews with 12 digitalization experts who have in-depth theoretical and practical knowledge in the field of digital transformation. With their help, the main statements about the success of digitalization were validated: management's attitude towards digital transformation; tools used for digital transformation; organizational factors; external environmental factors.

The method of sampling is a complex random stratified sample. According to the criterion of the presence of restrictions in the selection - limited, according to the criterion of the researcher's intervention in the selection - random, in other words complex random - stratified. The stratified sample is characterized by the separation of separate strata according to a given criterion and the emission of units by random selection within the individual subset. We have chosen such a sample because it increases statistical efficiency and collects adequate data for the individual subsets and is suitable in the presence of differences in the studied population.

For processing the information, descriptive statistics methods (percentage distribution, average values, standard deviation), dispersion, factor and correlation analysis were used. The processing and analysis of the obtained results were carried out using Microsoft Excel.

Based on the studies reviewed, we conducted one that aimed to establish the level of digitalization of Bulgarian SMEs by the beginning of 2025. For this purpose, we developed a survey with 13 questions, which we sent to representatives of SMEs in the country by e-mail. The survey was addressed to 150 managers of micro, small and medium-sized companies, and we received a response from 114 of them. It was conducted in the period 10.01.2025-10.02.2025.

4. RESULTS AND DISCUSSION

The results are shown in the following graphs. When asked about the size of SMEs and the majority of respondents indicated that they were small enterprises – 45%, followed by those who defined themselves as micro enterprises with up to 10 people – 32%, 20% were in the category of medium-sized enterprises and 3% were large enterprises (see Fig. 2).

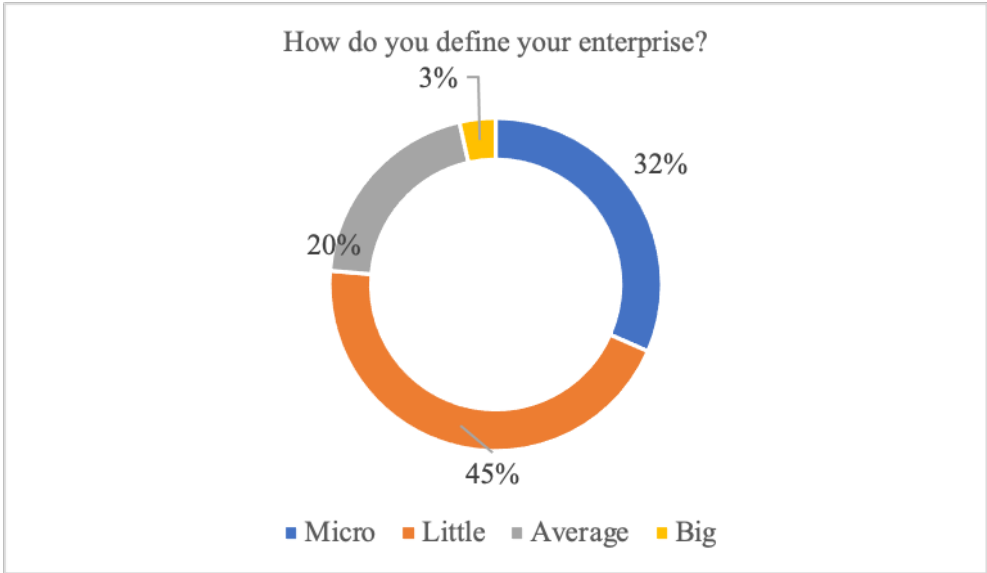


Figure 2 Size of the surveyed enterprises

The largest percentage of the surveyed enterprises, as can be seen from Fig. 3, operate in the trade sector (46 units), followed by hotels and restaurants (24 units), transport (15), construction (11), etc.

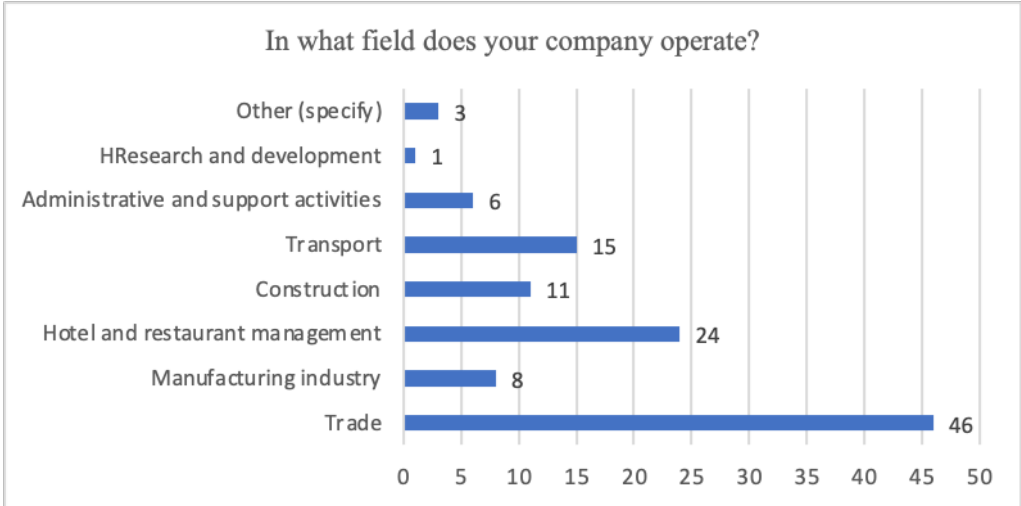


Figure 3 SME Scope of Activity

96% of respondents hold a management position in the surveyed SME, as shown in Figure 4.

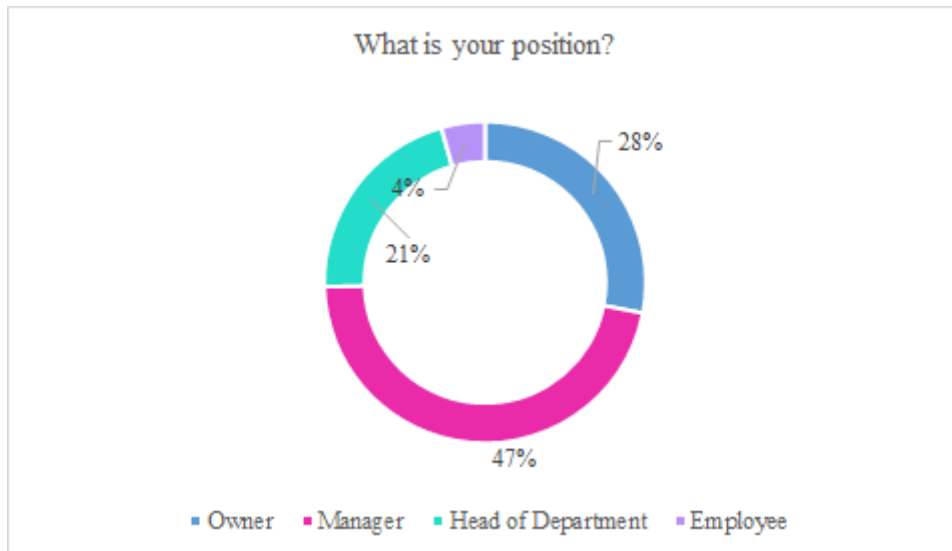


Figure 4 Position of the surveyed respondents

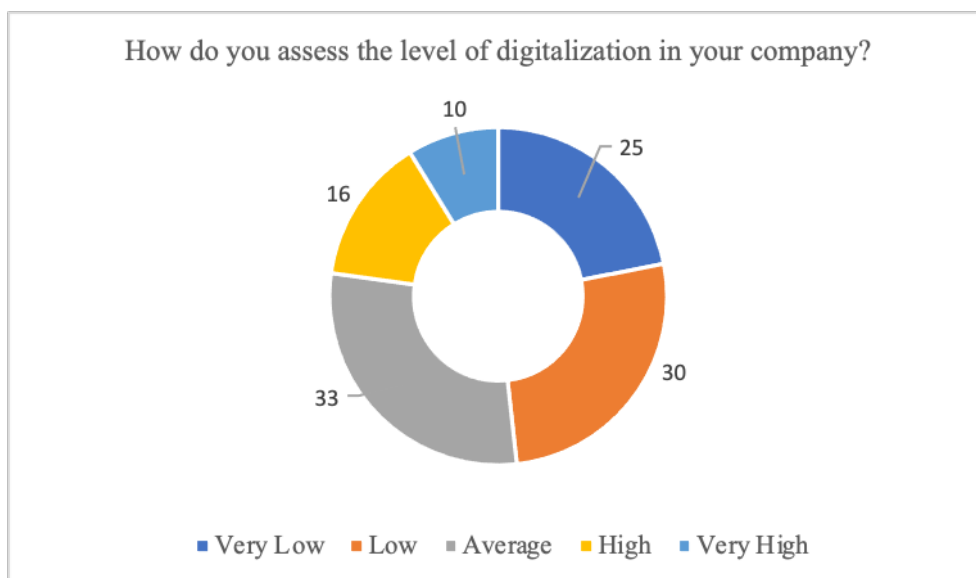


Figure 5 Level of digitalization of SMEs

Over 50% of respondents assessed the level of digitalization of their enterprises as very low and low, and only 9% as very high. The reasons for this can be found on one hand, in the fact that a large part of the companies are not familiar with the European programs that provide funds for the purchase of various software and hardware systems, and on the other hand, in the relatively low level of digital skills of their employees, which is also evident from the following graph.

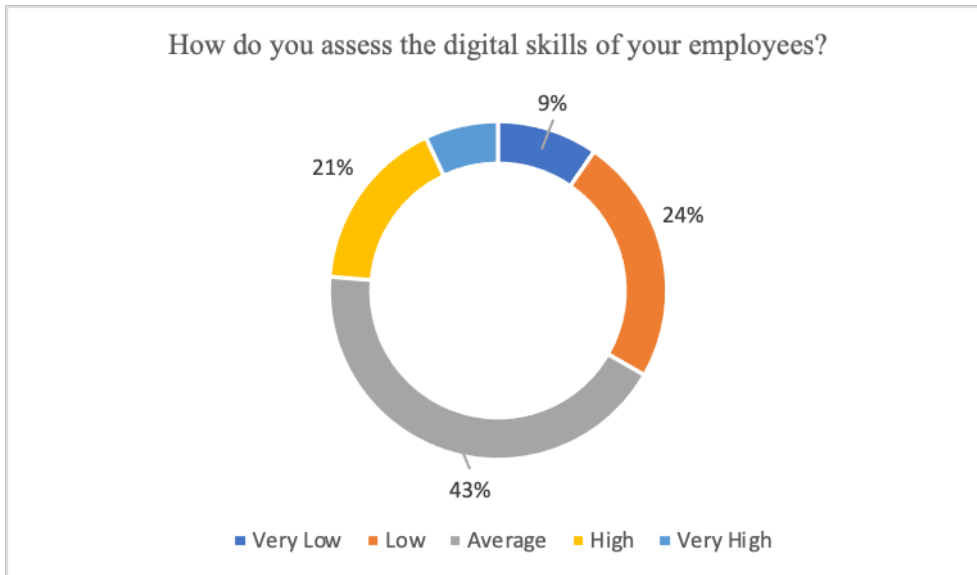


Figure 6 Digital skills of employees in SMEs

Over 30% of respondents rated their employees' digital skills as very low or low, and 43% as average, which in our opinion is one of the reasons for the insufficient digitalization of SMEs.

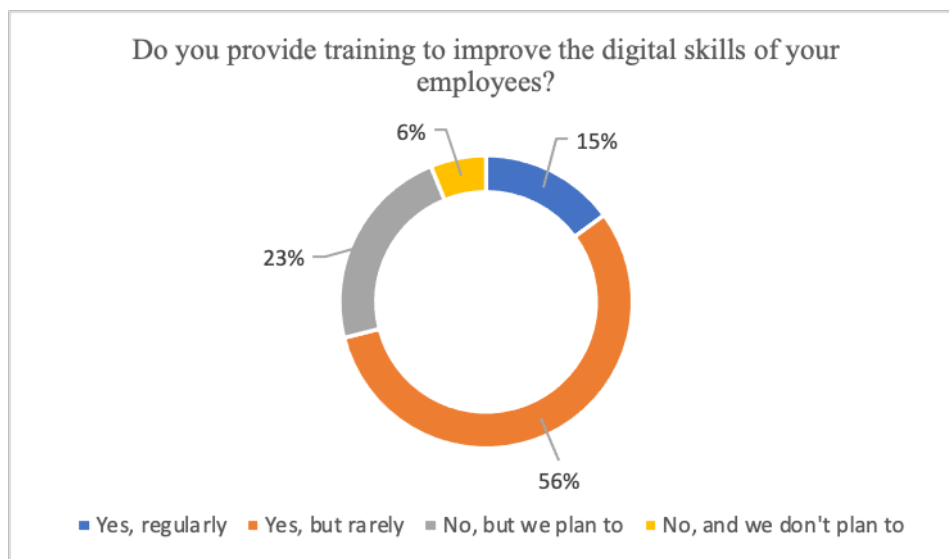


Figure 7 Employee training to improve their digital skills

In this regard, attracting SMEs to invest in employee training is particularly important, but for almost 8% of respondents, this is not a priority. It is encouraging that over 50% have realized the importance of such training, and 15% conduct such training regularly.

Other problems facing the digitalization of SMEs in Bulgaria are the lack of financial resources, lack of information, and resistance from employees.

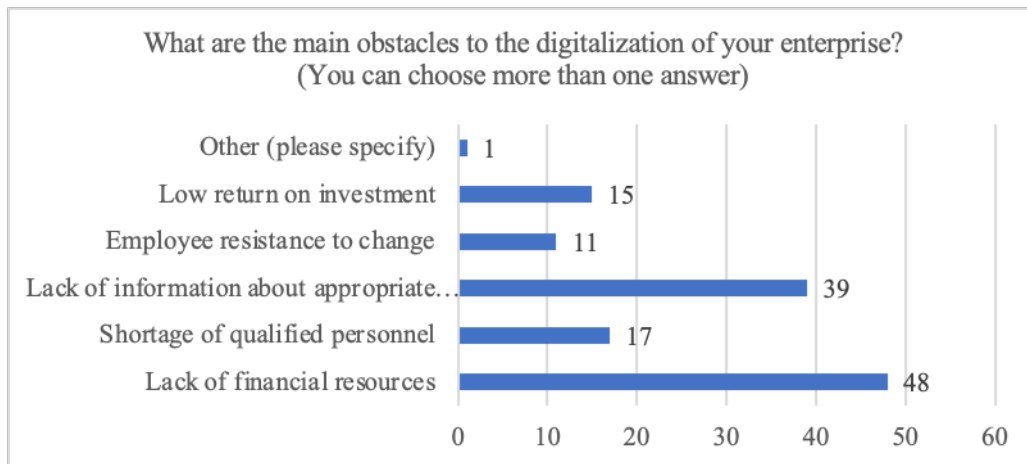


Figure 8 Problems facing the digitalization of SMEs

Also, a large part of the respondents do not invest in modern digital systems, as can be seen from the following graph.

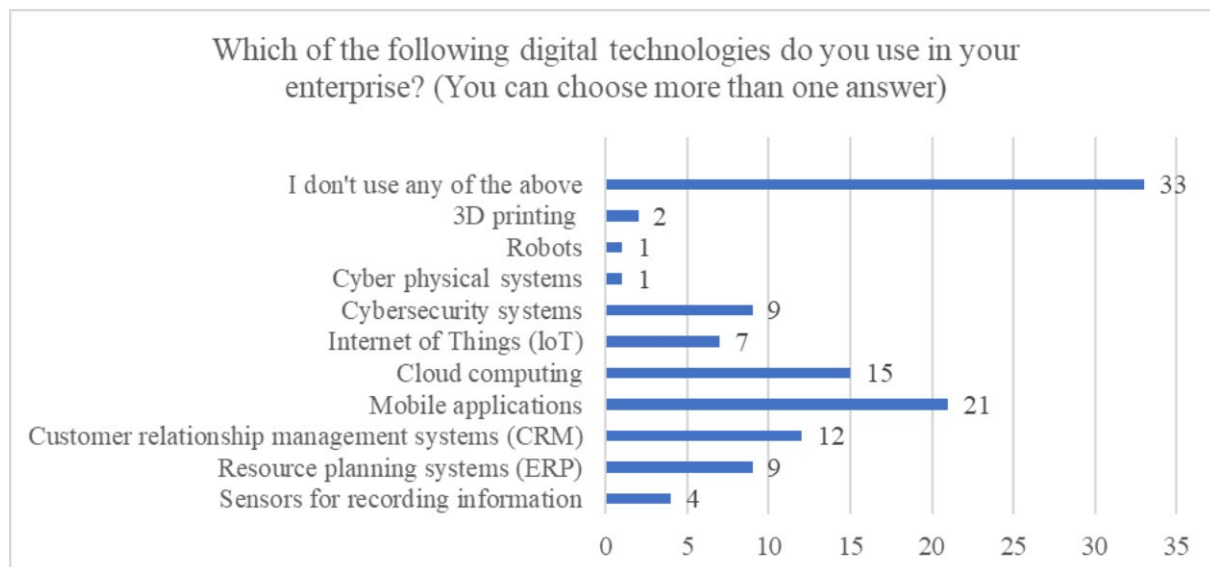


Figure 9 Digital technologies used in SMEs

33 of the respondents did not invest in new technologies in any of the above categories, while the rest focused on mobile applications, cloud computing and customer relationship management systems.

An opportunity to improve this situation is the procedure launched by the Ministry of Innovation and Growth in January 2025 for the introduction of technologies from the field of Industry 4.0. in enterprises, as well as in the National Strategy for SMEs for the period 2021-2027, which is based on the progress achieved under the National Strategy for the Promotion of Small and Medium-sized Enterprises 2014-2020.

To increase the competitiveness of SMEs, including those from Bulgaria in the period until 2027, under the Horizon EUROPE program, the European Union has taken a number of measures by providing 7.1 billion euros for the implementation of innovations. Support for access to markets, the use of ICT solutions and digitalization of processes, and increasing the digital skills of employees is also provided by the Recovery and Resilience Mechanism.

5. CONCLUSION

This review consolidates contemporary research on SMEs' digitalisation, highlighting key enablers, barriers, and strategic implications. While digitalization presents immense opportunities, challenges such as financial constraints, risk aversion, and technological limitations persist. Digital maturity models, strategic frameworks, and policy interventions are essential to facilitate SMEs' digitalisation and sustainable growth. Future research should focus on industry-specific digitalization strategies, the role of digital entrepreneurship, and the long-term impacts of digitalisation on SMEs' performance and internationalization.

The results confirm that digitalization opens a wealth of opportunities for Bulgarian SMEs, including but not limited to access to markets, business processes optimization, data-driven decision-making, and greater transparency in relations with stakeholders. Yet the journey to digital maturity is anything but linear. Ongoing challenges, such as limited financial resources, a scarcity of trained digital professionals and a wide divide in technological infrastructure between towns and the countryside, still hamper progress. These obstacles highlight the critical need for cohesive digital strategies, targeted investment, and inclusive policy intervention.

Strong strategic frameworks, digital maturity models, and government-backed support schemes are also needed to help SMEs navigate this transformation. The study highlights that a sound digital transformation is primarily contingent upon a clear digital strategy, strong leadership commitment, and the ability to pivot existing business models to rapidly changing technological context. Furthermore, enhancing digital competencies among the workforce is essential to ensure that SMEs are able to properly manage and sustain digital innovations.

The study's significance goes beyond business concerns – it can also help policymakers and academic researchers in critical ways. Policy makers can use the results to help deliver targeted funding, infrastructure needs and specialized training programs. Academically speaking, from a theoretical point of view, this research adds toward understanding of digital adoption in SMEs, in particular, in emerging economies similar to Bulgaria.

In the future, further work on industry specific digitalisation strategies and exploring the contribution of digital entrepreneurship for innovation and resilience is needed. This indicates the importance of longitudinal studies to understand the long-term effects of digital adoption on the performance, growth, and internationalization of SMEs. These dynamics must be understood if more targeted, sector-sensitive digital roadmaps are to be developed that take into account the nuanced needs and capacities of SMEs.

By tackling current problem points and reinforcing the key elements that empower digital transformation, SMEs have what it takes to embrace the digital future with confidence – opening new avenues for innovation, collaboration and sustainable growth.

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