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Digital transformation in Small and Medium-sized enterprises – The case of North Macedonia

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Abstract: Digital transformation represents a key factor for enhancing competitiveness and introducing innovation in the global environment. To increase efficiency, productivity, and market performance, small and medium-sized enterprises (SMEs), as drivers of economic development, face the need to adapt their working conditions and transform existing processes toward new digital technologies.

The subject of this research focuses on analyzing the state of digital transformation among small and medium-sized enterprises in the Republic of North Macedonia, through the identification of key challenges, opportunities, and strategies applied by these companies.

In the practical part of this paper, by the questionnaire method, an empirical study was conducted aimed at analyzing the support measures and the level of awareness among SMEs regarding digital transformation policies. The goal of the research is to determine the extent to which state institutions provide support for the introduction of transformational changes that contribute to the digitalization of SME operations.

The results of the conducted research confirm the main hypothesis that there is insufficient support in the process of implementing digital practices and solutions in business operations.

Keywords: digital enterprises, digital transformation, policies, small and medium-sized enterprises, sustainability.

Introduction

Small and medium-sized enterprises (SMEs) represent a main factor in economic growth and innovation. Therefore, they play a particularly important role in the process of digital transformation. The rapid technological development and significant changes in business operations make digital transformation an essential process that contributes to changes in the way organization's function, regardless of their size or sector of activity. Digital transformation

can be analyzed as a highly dynamic field through a wide range of implications and considerations (Tsou & Chen, 2021).

In modern business conditions, SMEs are challenged by notable challenges arising from the accelerated process of digitalization. In combination with these challenges, the integration of digital technologies in business operations simultaneously creates new opportunities for increasing efficiency and competitiveness among companies. The digital transformation of enterprises may be analyzed as, on one hand, from the aspect of applying digital technologies and techniques in daily operations, and on the other hand, from the perspective of creating new products and services (Marija Magdincheva-Shopova, Aneta Stojanovska-Stefanova, 2024).

Innovative approaches to SME development are closely linked to the integration of digitalization into all aspects of business operations. However, this process is often limited by financial constraints and underdeveloped organizational capacities, which act as barriers to implementing digital tools in business processes. A fundamental prerequisite for improving the position and long-term sustainability of SMEs, in terms of implementing digital tools, is facilitated by institutional support and the creation of appropriate policies to encourage digitalization.

The purpose of this paper is to analyze the state of digital transformation among small and medium-sized enterprises in the Republic of N. Macedonia, through the identification of the main challenges, opportunities, and strategies applied by these companies. Emphasis is placed on assessing institutional support and the level of awareness among companies regarding national digitalization policies.

To achieve the research objectives in this paper has approached an appropriate methodological approach. The selected approach is based on the use of classical research methods through which relevant insights into the studied phenomenon have been obtained. The expected benefits for the broader economy from the implementation of digital transformation policies and the development referred to as “digital enterprises” include advancing the digitalization process, increasing operational efficiency, and fostering innovation and competitiveness. The active role of entrepreneurs and employees is crucial for achieving a higher level of digitalization and ensuring long-term economic development.

Materials and methods

To achieve the objectives set in this research, an appropriate methodological approach was applied, enabling a systematic study of the focus of this study. Using classical scientific methods, relevant insights and conclusions pertaining to the research topic were obtained.

While formulating the questionnaire for the study, multiple scientific methods were employed including the methods of analysis and synthesis, as well as other specific methods categorized into specialized, quantitative, and interrelated research techniques.

The application of analysis and synthesis methods facilitated a comprehensive review of relevant professional and scientific literature in the field of digitalization and the transformation

of organizational work practices into small and medium-sized enterprises (SMEs) toward a sustainable digital work model. Through empirical research methods, an analysis was conducted of the measures implemented by SMEs to adopt digital work practices.

The processing and presentation of the obtained results were carried out using methods of analysis, induction, and deduction, providing an overview of the conditions and trends associated with the introduction of sustainable digitalization practices in business operations.

To assess the awareness of entrepreneurs and their readiness to implement digital work practices, which would facilitate the transformation process in companies identified as "digital enterprises," a practical study was conducted. A survey questionnaire was utilized to conduct an online study between January 1, 2025, and June 30, 2025, involving 100 respondents, of whom 52 expressed interestc in answering the questions posed.

Results

Based on the research conducted and the analysis of the collected data, it was determined that the survey questionnaire used for the study was completed by a total of 52 companies (small and medium-sized enterprises) that participated in the research and expressed interest in responding to the questions.

The organizational characteristics of the companies (general information regarding company size, sector of operation, location, and years of operation) included in the study are presented in Table 1, Table 2, Table 3, and Table 4.

Table 1: Structure of companies in terms of number of employees

Number of employees	Number of companies	Structure
0-9 employees	29	56%
10-49 employees	18	35%
50 до 249 employees	5	9%

Source: Own research

Table 2*:* Structure of companies by the industry in which the companies operate

Sector	Number of employees	Structure
Production	4	8%
Trade	18	35%
Services	23	44%
IT Sector	7	13%

Source: Own research

Table 3: Geographical distribution of the companies across different regions

Geographical region	Number of companies	Structure
Skopje	29	56%
Eastern Region	6	11%
Southeastern Region	15	29%
Western Region	2	4%

Source: Own research

Table 4*:* Structure of companies by years of operation

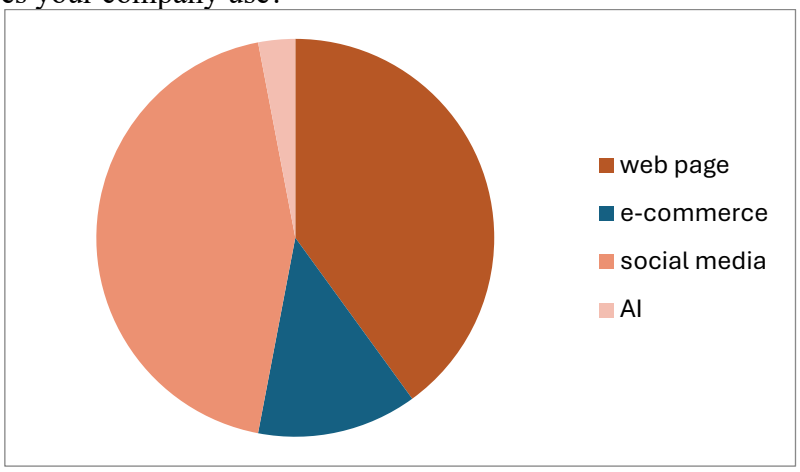
Years of operation	Number of companies	Structure

Up to 5 years	25	48%
5–10 years	18	35%
More than 10 years	9	17%

Source: Own research

Analysis of the responses indicates that, for the first question *"Which digital technologies does your company use?"*— many of companies employ social media for marketing (23 companies, 44%). A company website is maintained by 21 companies (40%), online sales are implemented by 7 companies (13%), and only 1 company (3%) utilizes artificial intelligence.

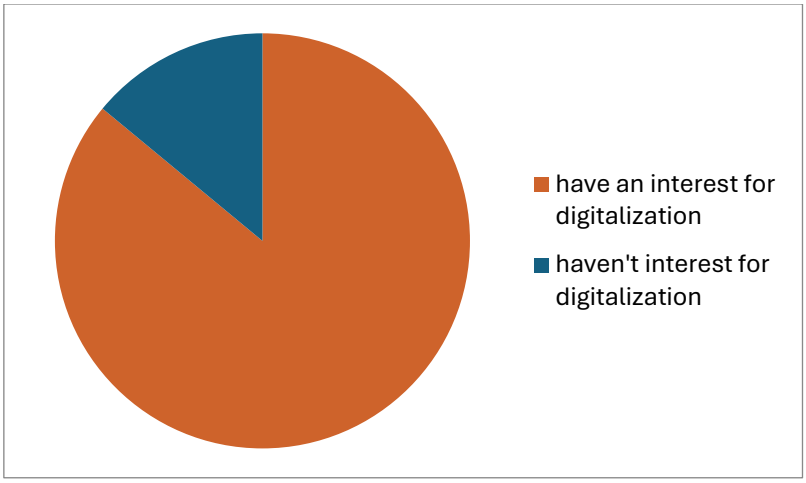
Figure 1: Graphical representation of the responses to the question – "Which digital technologies does your company use?"



Source: Own research

For the next question-*"Would you initiate a digital transformation process in your company?"*—the majority of participating companies, 45 companies (86%), indicated that they would undertake a digital transformation process, whereas only 7 companies (14%) stated that they would not.
The results obtained are presented in Figure 2.

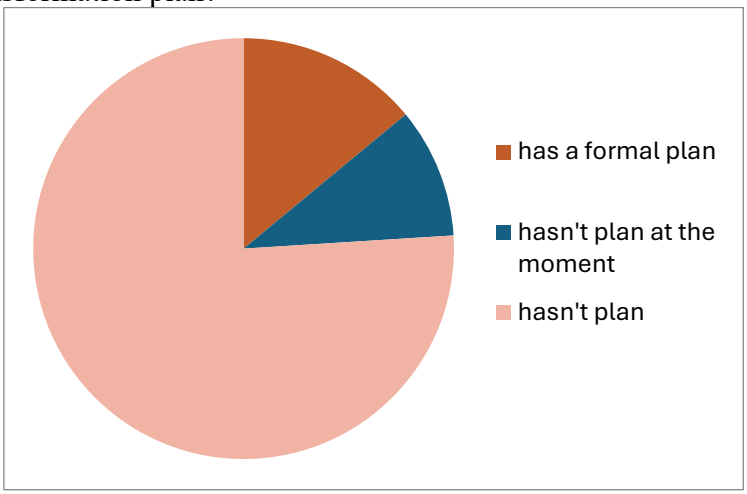
Figure 2: Graphical representation of the responses to the question – Would you initiate the process of digital transformation in your company?



Source: Own research

In response to the question—*"Does your company have a digital transformation plan?"*—with the possible answers being: formally adopted plan, currently no plan but planned, and no formal plan, the following results were obtained: the majority of participating companies, 40 companies (76%), reported that they do not have a digital transformation plan. Five companies (10%) currently do not have a plan but intend to adopt one in the future, and 7 companies (14%) stated that they do not have a formal plan.The results obtained are presented in Figure 3.

Figure 3: Graphical representation of the responses to the question – "Does your company have a digital transformation plan?"



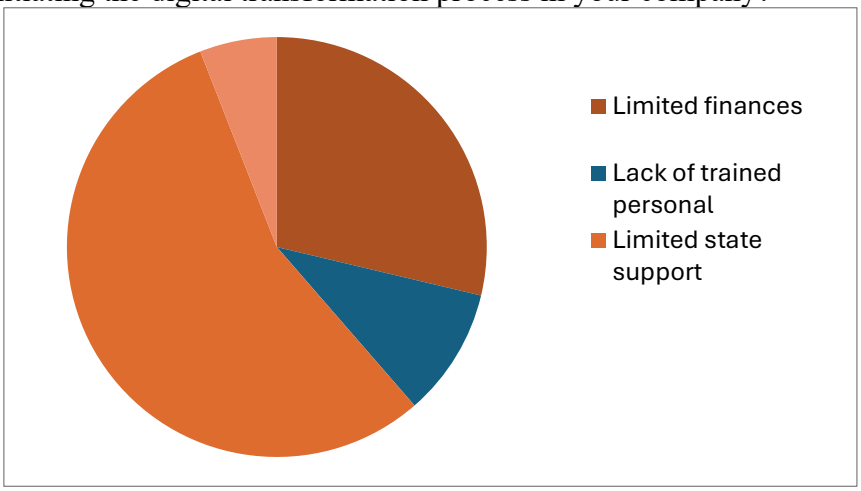
Source: Own research

In response to the question—*"What are the main reasons for initiating the digital transformation process in your company?"*—with the possible answers being: insufficient financial resources, lack of skilled employees, resistance to organizational changes, limited

technological knowledge, and weak support from government institutions, the results were as follows: the majority of companies, 29 companies (56%), indicated that weak support from government institutions is the primary reason. Fifteen companies (29%) identified insufficient financial resources as a limiting factor, 5 companies (10%) reported that the lack of skilled employees hinders the initiation of the digital transformation process, and 3 companies (6%) considered limited technological knowledge to be the main reason preventing the implementation of this process in their company.

The results are presented graphically in Figure 4.

Figure 4: Graphical representation of the responses to the question – "What are the main reasons for initiating the digital transformation process in your company?"

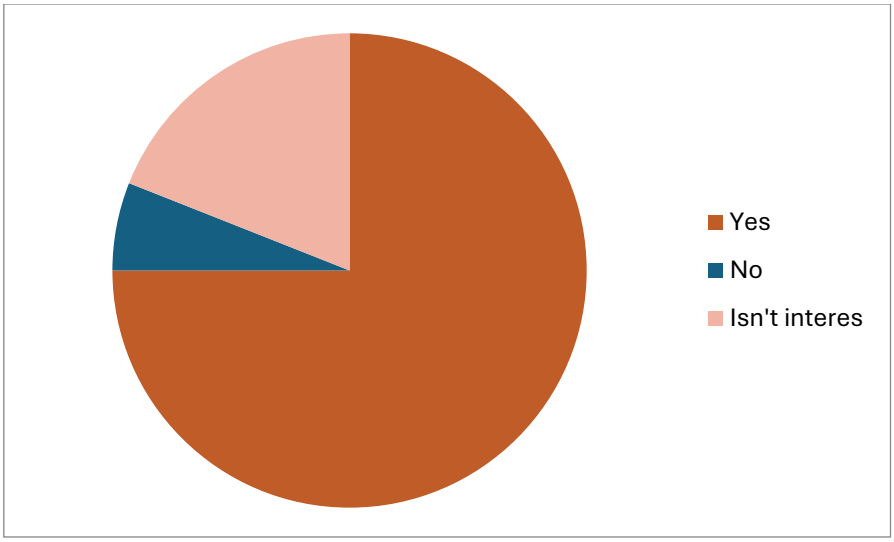


Source: Own research

The final question focused on the use of support programs for implementing the digitalization process, specifically: *"Will your company use government support programs for the digitalization process?"* with the possible answers being will use, will not use, and no interest in using support programs. The results indicate that many of respondents, 39 companies (75%), stated that they would use support programs. Ten companies (19%) reported having no interest in this type of support, while only 3 companies (6%) indicated that they would not use government support programs for the digitalization process.

The results are presented graphically in Figure 5.

Figure 4: Graphical representation of the responses to the question –"Will your company use government support programs for the digitalization process?"



Source: Own research

Discussions

The results of the study indicate the level of digitalization and the readiness for digital transformation among the companies included in the survey. Based on the responses, it can be concluded that companies most commonly use digital technologies in the form of social media for marketing (44%) and websites (40%), whereas innovative technologies such as online sales and artificial intelligence are relatively less represented, at 13% and 3%, respectively.

This suggests that companies are primarily focused on basic digital tools that provide direct visibility and marketing impact, while more advanced digital solutions are still weakly implemented.

Regarding the readiness of companies to initiate the digital transformation process, it is noted that a large proportion of companies (86%) are open to such processes, which represents a positive indicator of their willingness to adopt more advanced digital work practices. Digital transformation enhances operational efficiency and accelerates business processes. Increasing the level of digitalization not only contributes to job creation but also positively affects the well-being and social prosperity of individuals (Janevski, 2024).

However, in terms of the planning process and the existence of a formal digital transformation plan, there is a significant discrepancy. Specifically, 76% of companies do not have a plan, while only a small proportion either possess a formal plan or are planning to initiate the planning process. The initial phases of this transformation often begin with assessment and planning, during which the company establishes a digital vision and strategic objectives (Strohmeier, 2020).

The responses obtained indicate a gap between the interest in digital transformation and the actual preparedness of companies to implement it. In other words, while companies recognize the need for transformation, they lack concrete strategies for its execution.

Weak support from government institutions (56%) represents the primary obstacle to initiating the digital transformation process, confirming the importance and role of state institutions in promoting digitalization among companies. To highlight the key role played by employees, organizational leaders, managers, and human resources departments in this transformation process, the significant factors in digital transformation are classified into three distinct levels: individual, group, and company (Trenerry et al., 2021).

Financial constraints (29%) are also identified as a major barrier in this process, indicating the need for a combined approach of financial and educational support. Developing skills and providing appropriate training is an urgent imperative, as companies undergo digital transformation (Јаневски и др., 2025).

The data obtained from the study indicates that many companies (75%) are interested in utilizing government support programs, suggesting that, if appropriate state programs exist, companies are willing to use them. However, 19% of companies expressed no interest, which may indicate a lack of information, trust, or relevance of existing programs, and could be a subject for further research.

Conclusions

Digital transformation represents a fundamental prerequisite for enhancing competitiveness and promoting the sustainable development of small and medium-sized enterprises (SMEs) in the Republic of North Macedonia. The adoption of digital technologies by companies is driven not only by the pursuit of improved performance outcomes (Nusantara et al., 2024), the strengthening of process and data security (Danilyan & Dzeban, 2024), or alignment with broader digital transformation imperatives (Priyanjani et al., 2024), but also by the need to maintain competitiveness in the evolving digital economy.

The obtained results indicate that companies are prepared to implement digital changes; however, a significant gap remains between interest in digitalization and the actual application of digital technologies. Most enterprises use basic digital tools, such as social media and websites, while advanced solutions, including online sales and artificial intelligence, remain underutilized.

The primary obstacles to digital transformation are identified as insufficient institutional support, limited financial resources, and a shortage of skilled human resources. The study of the human factor plays a central role in the development of knowledge networks (Reagans & Zuckerman, 2001) and entrepreneurial processes (Camelo et al., 2000; Li et al., 2006; Becerra & Álvarez, 2011).

The promotion of digital skills development and the creation of an enabling regulatory and market environment can be achieved through the establishment of more effective mechanisms for financial and educational support by state institutions. A successful digital transformation process, which contributes to increased productivity, innovation, and competitiveness of Macedonian small and medium-sized enterprises (SMEs), is facilitated through coordinated action between public institutions and private companies. Digital transformation fosters the emergence of new companies that base their business models on innovative approaches, while

simultaneously compelling existing companies to reassess their operations and adopt digital practices. For the successful implementation of digital transformation, companies require concrete strategies, enhanced support from state institutions, and investment in human capital.

Conflict of interests

I declare no conflict of interest.

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