

SYSTEMIC ENHANCEMENT OF SMES' PERFORMANCE THROUGH DIGITAL TRANSFORMATION

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Abstract

The digital transformation of Romanian small and medium-sized enterprises (SMEs) has become a key driver of competitiveness, innovation, and long-term sustainability. This research explores the impact of digitalization on small and medium-sized enterprises management, with a particular focus on the perceptions of managers regarding digital tools, communication processes, and customer relationship management (CRM), highlights both the opportunities and challenges brought by digital adoption. The importance of this applied research stems from the increasing need to understand how digitalization influences management processes within small and medium-sized enterprises (SMEs), a vital sector for Romania's economy. In a context where digital transformation is no longer an option but a strategic necessity, analyzing the impact of these changes from a managerial perspective provides relevant insights for adapting organizational strategies and strengthening the competitiveness of these entities. The results indicate that while digital technologies enhance internal and external communication and increase operational efficiency, barriers such as limited financial resources, lack of digital skills, and resistance to change still persist. The study offers valuable insights into how digitalization influences strategic decisions in Romanian small and medium-sized enterprises and provides recommendations for facilitating the digital transition in this sector.

Keywords: digitalization, SMEs, management, communication, digital tools

Classification JEL: M15, O33, L26

1. Introduction

In national economies, and in Romania, (SMEs) have a very high share in the total number of companies and play an essential role, as they generate economic growth, stimulate innovation, create jobs. This makes their performance crucial for the entire functioning of the state. So, many studies shows that small and medium-sized enterprises (SMEs) significantly contribute to growth in global economies in terms of innovation, employment, production and services. (Dung, 2024; Gherghina et al., 2020).

In the current economic structure, small and medium-sized enterprises (SMEs) represent a key pillar of the business environment, accounting for over 99% of all companies in Romania. This segment makes a significant contribution to the formation of the Gross Domestic Product (GDP) and job creation, playing a central role in maintaining the country's economic and social balance. According to recent data, SMEs make up approximately 99.7% of all companies; however, their economic performance remains below that of large enterprises, recording a productivity rate nearly 40% lower. Furthermore, the contribution of SMEs to national exports stands at only 30%, which reflects their limited integration into external markets and insufficient competitiveness within the European context. These aspects are negatively influenced by several factors such as energy price volatility, general economic uncertainty, and infrastructural deficiencies. In this context, the ability of SMEs to adapt and perform in a competitive environment is constantly being challenged.

Digital technology has radically transformed international business. (Wang et al., 2024, Bargoni et al., 2024). SME digitalization is an economic issue of interest, widely analyzed by researchers. In this era of globalization, in analyzing the efficiency and development of any company, digitalization represents a crucial element. (Ciubota, 2024)

Romanian entrepreneurs' perception of the current economic climate highlights the real difficulties faced by the business sector. According to analyzed data, 41.26% of SMEs consider the economic environment to be unfavorable for business development, while 27.86% perceive it as

neutral, and only 30.89% of companies view it as conducive to expanding and consolidating economic activities.

Over the past two years, statistical data show that 44.09% of SMEs have operated under similar conditions, 27.32% have experienced positive growth, while 28.59% have reduced their activity volume. This situation reflects, both quantitatively and qualitatively, the current level of resilience, trends, and dominant perceptions among Romanian entrepreneurs.

Among the main difficulties encountered by SMEs in 2024 are: inflation (52.89%), unfair competition (46.06%), increased salary expenses (40.05%), declining domestic demand (33.10%), human resource challenges—especially recruitment and employee retention (31.71%), uncertainty regarding future developments (29.86%), external competition pressure (29.51%), and delays in invoice collection (25.81%).

Table 1. Dynamics of SME Activities

Year	Upward Trend (%)	Constant Activity (%)	Declining Activity (%)
2018	13,78	66,79	19,43
2019	15,82	63,44	20,74
2020	10,14	47,89	41,97
2021	21,86	43,53	34,61
2022	25,91	44,61	29,48
2023	26,40	45,00	28,60
2024	27,32	44,09	28,59

Source: Processed by the author based on data from: www.cnipmmr.ro/tag/carta

The analysis of the evolution of SMEs in Romania over the past seven years highlights a trend of economic volatility and continuous adaptation, especially in the context of both external and internal challenges faced by small and medium-sized enterprises.

During the period 2018–2024, SMEs in Romania went through a transition stage from relative stability to gradual recovery. If in the years 2018–2019 the market was dominated by firms with constant activity, reflected by a high percentage of partially digitalized SMEs (66.79% in 2018 and 63.44% in 2019), the year 2020 marked a severe rupture caused by the COVID-19 pandemic, with a record percentage of 41.97% of enterprises reaching an advanced level of digitalization, in an attempt to respond to the health and economic crisis.

2. Study of the impact of digitalization on the management of SMEs

For SMEs, digitalization facilitates their efficiency and diversification, allowing them to access new markets as well as new potential customers. The importance of this applied research stems from the increasing need to understand how digitalization influences management processes within small and medium-sized enterprises (SMEs), a vital sector for Romania's economy. In a context where digital transformation is no longer an option but a strategic necessity, analyzing the impact of these changes from a managerial perspective provides relevant insights for adapting organizational strategies and strengthening the competitiveness of these entities.

The main objective of the research is to identify the impact of digitalization on the performance of Romanian SMEs from a managerial perspective.

Secondary Objectives:

- ✓ To analyze managers' perceptions regarding the efficiency of management activities following the digitalization process;
- ✓ To determine the extent to which digital solutions have been implemented within SMEs over the past three years;
- ✓ To evaluate the impact of digitalization on internal and external communication within SMEs;
- ✓ To identify the main barriers perceived by managers in the digitalization process;

- ✓ To determine the correlation between managers' age and their openness to digital technologies;
- ✓ To assess the influence of CRM usage on SME performance;
- ✓ To analyze the contribution of digitalization to strategic decision-making processes.

General Hypotheses of the Study:

- ✓ The majority of SME managers believe that digitalization has a positive impact on the efficiency of management activities;
- ✓ Most SMEs have implemented at least one digital solution in the last three years;
- ✓ Digitalization contributes to the improvement of internal and external communication within SMEs;
- ✓ High costs represent the main barrier to the digitalization process for SMEs;
- ✓ Younger managers are more open to adopting digital technologies compared to more experienced ones;
- ✓ SMEs that use digital tools for customer relationship management (CRM) perform better;
- ✓ Most managers consider that digitalization contributes to improved performance and more effective strategic decision-making.

STATISTICAL HYPOTHESES

H0: More than 70% of SME managers believe that digitalization has a positive impact on the efficiency of management activities.

H1: Less than 70% of SME managers believe that digitalization has a positive impact on the efficiency of management activities.

H0: More than 60% of SMEs have implemented at least one digital solution in the past three years.

H1: Less than 60% of SMEs have implemented at least one digital solution in the past three years.

H0: More than 65% of managers believe that digitalization contributes to the improvement of internal and external communication.

H1: Less than 65% of managers believe that digitalization contributes to the improvement of internal and external communication.

H0: More than 50% of SME managers consider high costs to be the main barrier to digitalization.

H1: Less than 50% of SME managers consider high costs to be the main barrier to digitalization.

H0: More than 60% of managers under the age of 40 are more open to adopting digital technologies than those over 40.

H1: Less than 60% of managers under the age of 40 are more open to adopting digital technologies than those over 40.

H0: More than 55% of SMEs using CRM (Customer Relationship Management) systems perform better than those that do not use such tools.

H1: Less than 55% of SMEs using CRM (Customer Relationship Management) systems perform better than those that do not use such tools.

H0: More than 65% of managers believe that digitalization contributes to better strategic decision-making.

H1: Less than 65% of managers believe that digitalization contributes to better strategic decision-making.

The questionnaire was designed to conduct research on the impact of digitalization on the management of small and medium-sized enterprises (SMEs) in Romania, from a managerial perspective. It is structured according to key aspects correlated with the research objectives and comprises a total of 16 items.

$$n = \frac{1,96^2 \cdot 50 \cdot 50}{10^2} = 96,04 \text{ people.} \quad (1)$$

The sample represents a randomly selected subset of the general population, from which information was collected in order to generalize the conclusions derived from the investigation. When determining the sample size, statistical constraints were taken into account. However, for practical reasons, the questionnaire was administered to a sample of 110 SME managers from Romania, in order to achieve a smaller margin of error and better representativeness.

$$E = \sqrt{\frac{z^2 \cdot p \cdot q}{n}} = \sqrt{\frac{1,96^2 \cdot 50 \cdot 50}{110}} = \sqrt{\frac{9604}{110}} = 9,34\% \quad (2)$$

The confidence interval used in this study is:

$$p \pm z \sqrt{\frac{p(100-p)}{n}} = 0,5 \pm 1,96 \sqrt{\frac{0,5 \cdot 0,5}{110}} = 0,5 \pm 0,093 \Rightarrow [0,407; 0,593] \quad (3)$$

The confidence interval used in this research reflects the degree of certainty regarding the estimations based on the collected data. The research employed simple random sampling, depending on the availability and willingness of managers to participate in the study. This implies that the exact probability of each individual being included in the sample is not known, yet the approach enables the acquisition of relevant results in line with the proposed objectives.

The empirical research was conducted between February and April 2025 on a sample of 110 SME managers from Romania.

Hypothesis Testing

Testing hypotheses in a sample is essential in assessing whether the collected data support a specific assumption or hypothesis about the studied population.

1. H0: More than 70% of SME managers believe that digitalization has a positive impact on the efficiency of management activities.

H1: Less than 70% of SME managers believe that digitalization has a positive impact on the efficiency of management activities.

Table 3. Do you consider that digitalization has improved managerial processes?

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Yes	76	69,1%	69,1%	69,1%
	No	34	30,9%	30,9%	100%
	Total	110	100%	100%	

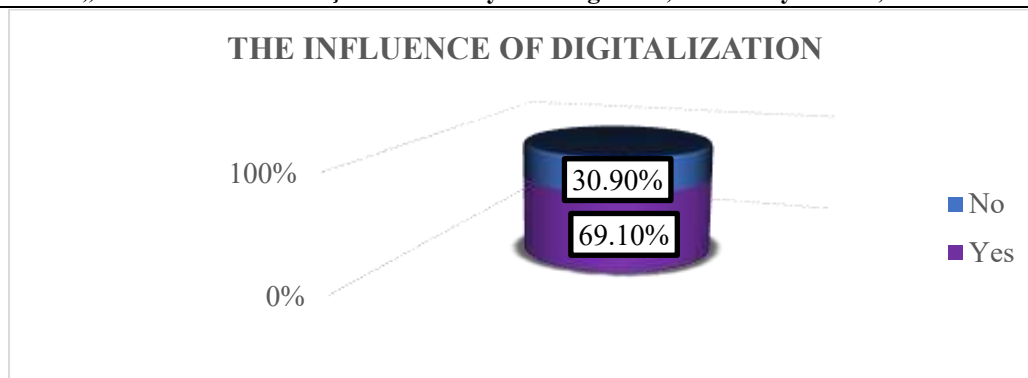


Figure 1. The influence of digitalization on the improvement of managerial processes in SMEs

The most frequent answer is “Yes” – 76 respondents, representing 69.1%, which indicates that the majority of SME managers believe that digitalization has improved managerial processes. However, 30.9% of respondents stated that digitalization has not had a significant impact on managerial processes.

Therefore, the null hypothesis H_0 , according to which over 70% of SME managers believe that digitalization has a positive impact on the efficiency of management activities, is not confirmed, as the percentage is 69.1%, below the proposed threshold. Thus, the null hypothesis H_0 is rejected and the alternative hypothesis H_1 is accepted.

2. H_0 : Over 60% of SMEs have implemented at least one digital solution in the last 3 years.

H_1 : Less than 60% of SMEs have implemented at least one digital solution in the last 3 years.

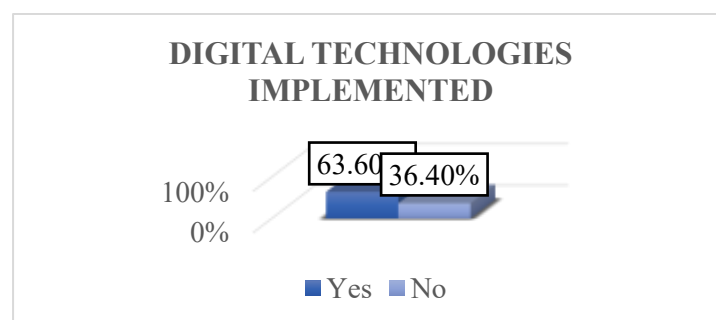


Figure 2. Digital technologies implemented in Romanian SMEs

The majority of managers, namely 63.6%, stated that they have implemented at least one digital solution within the SME they lead in the past 3 years. Only 36.4% responded negatively. Therefore, the null hypothesis H_0 is accepted, according to which over 60% of SMEs have implemented at least one digital solution in the last 3 years.

H_0 : Over 65% of managers believe that digitalization contributes to improving internal and external communication.

H_1 : Less than 65% of managers believe that digitalization contributes to improving internal and external communication.

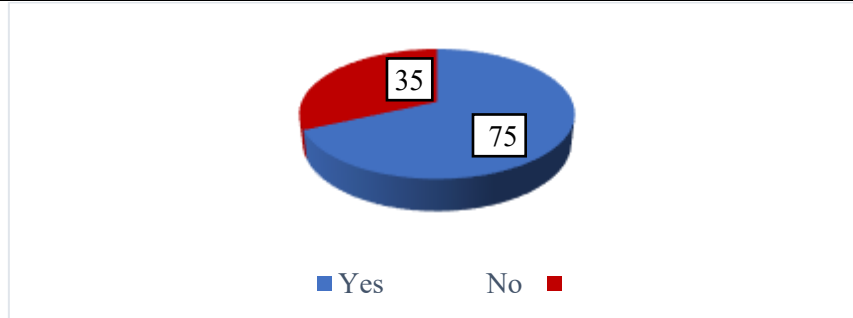


Figure 3. Managerial opinion on the impact of digitalization on internal and external communication

The majority of managers, namely 68.2%, declared that digitalization contributes to improving internal and external communication within SMEs. Only 31.8% disagreed with this statement. Therefore, the null hypothesis H_0 is accepted, according to which over 65% of managers believe that digitalization contributes to improving internal and external communication.

3. H_0 : Over 50% of SME managers consider high costs to be the main barrier to digitalization.
 H_1 : Less than 50% of SME managers consider high costs to be the main barrier to digitalization.

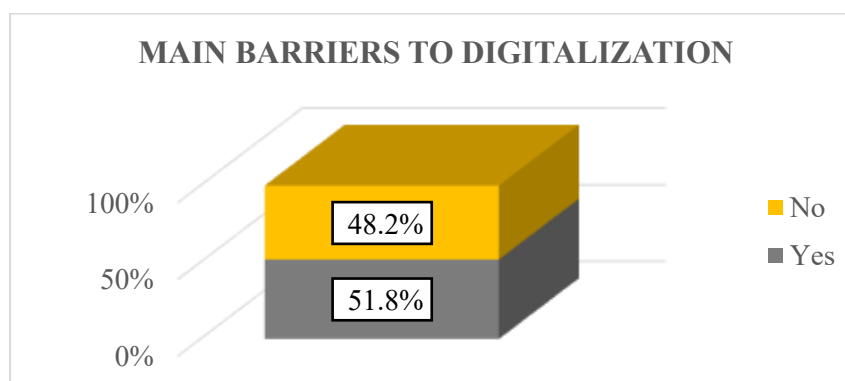


Figure 4. Distribution of SME managers' perceptions regarding the main barriers in the digitalization process

The table and chart above show that 51.8% of SME managers consider high costs to be the main barrier to digitalization, while 48.2% mentioned other barriers such as lack of digital skills, insufficient IT infrastructure, or employee reluctance.

Thus, the null hypothesis H_0 is accepted, according to which over 50% of SME managers consider high costs to be the main barrier to digitalization.

4. H_0 : Over 60% of managers under the age of 40 are more open to adopting digital technologies than those over 40.

H_1 : Less than 60% of managers under the age of 40 are more open to adopting digital technologies than those over 40.

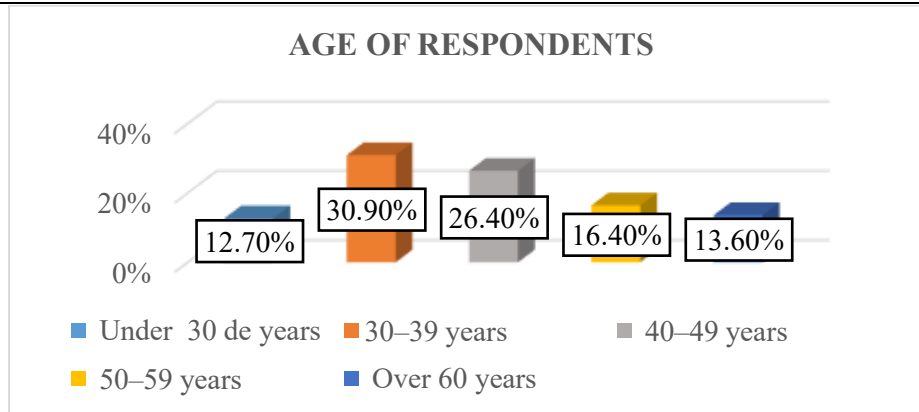


Figure 5. Age of SME Managers

The most frequent response is the "30–39 years" category – 30.9%, as this represents the most active professional segment, directly involved in decision-making and managerial processes within SMEs. These managers are also more receptive to innovation and the use of digital technologies. The second most represented group is aged 40–49 – 26.4%, characterized by consolidated professional experience and a balanced attitude toward technological change. Next comes the 50–59 age group – 16.4%, which, although less numerous, is increasingly involved in digitalization processes. In fourth place are respondents over 60 years old – 13.6%, whose participation, though lower, remains significant despite a slower pace of technological adaptation. Finally, the under-30 group – 12.7% – reflects the presence of a digitally native generation with high potential for integrating modern technological solutions, though their numerical representation in the sample is lower, possibly due to limited managerial experience.

5. H0: More than 55% of SMEs using Customer Relationship Management (CRM) tools report better performance compared to those not using such tools.
 H1: Fewer than 55% of SMEs using CRM tools report better performance compared to those not using such tools.

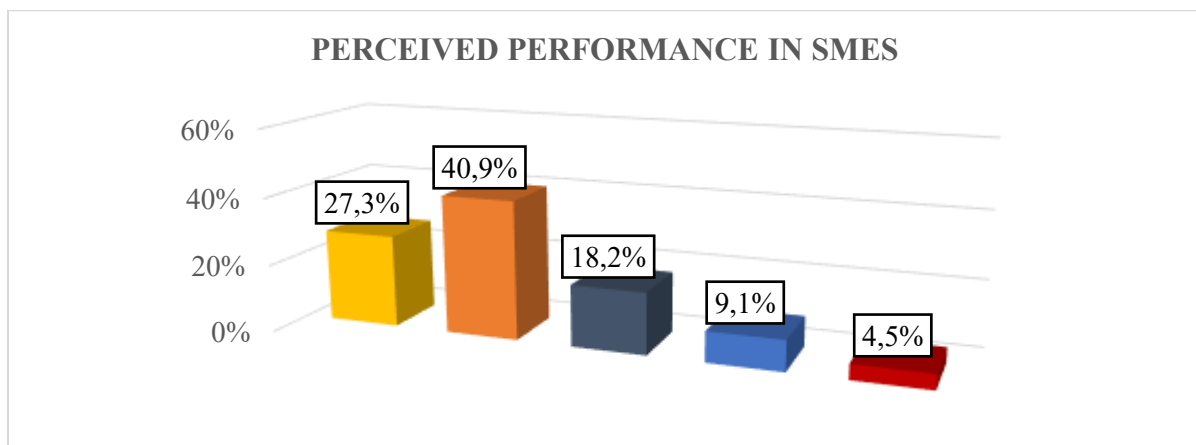


Figure 6. Perceived Performance in Romanian SMEs Using CRM Tools

The graph above shows that 68.2% of Romanian SMEs perceive their performance as significantly or very significantly improved following digitalization processes and the adoption of modern management solutions. Of these, 40.9% report a significant impact, while 27.3% report a very significant impact. At the same time, 18.2% of respondents consider the improvement to be only moderate, and 13.6% do not observe a notable contribution from these initiatives to managerial performance.

Therefore, the null hypothesis (H0) is accepted, confirming that over 55% of the analyzed SMEs report improved performance as a result of adopting digital technologies. This validates their positive impact on efficiency and competitiveness in Romania’s entrepreneurial environment.

The relationship between openness to digital technologies and the age of managers

It is assumed the following hypotheses:

H0: There are no significant differences between age groups of managers in terms of openness to digital technologies.

H1: There are significant differences between age groups of managers in terms of openness to digital technologies.

Table 4. What Level of Openness Do You Have Towards the Use of Digital Technologies in Your SME? Age Group?

Item		Age Group [Years]					Total
		Under 30	30 – 39	40 – 49	50 – 59	60+	
Do you perceive digitalization as a competitive advantage for your company? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Cannot Assess (Observed)	Expected Value	12 9.4	28 22.9	20 19.5	10 12.1	4 10.1	74
	Expected Value	12.7	46.5	55.5	5 3.4	6 2.9	21
	Expected Value Expected Value	1 1.9	2 4.6	4 3.9	3 2.5	5 2.0	15
Total	Expected Value	14 14	34 34	29 29	18 18	15 15	110 110

It is calculated the value of the statistic χ^2 , $\chi^2_{\text{calculat}} = 18,27$. After calculating the test statistic χ^2 it compares its value to the critical value for a significance level $\alpha = 5\% = 0,05$ and $df=8$ degrees of freedom. The following inequality holds $\chi^2_{\text{calculat}} = 18,27 > \chi^2_{0,05;8} = 15,51$.

Therefore, it can conclude that there are significant differences between age categories regarding the perception of digitalization as a competitive advantage in SMEs.

Analysis of the Relationship Using the Kolmogorov-Smirnov Test

The relationship between perception of managerial transformation through digitalization and manager age

It is assumed the following hypotheses:

H0: The maximum difference between the cumulative relative frequencies of managers under 40 (f_1) and those over 40 (f_2) is zero.

H1: The maximum difference between the cumulative relative frequencies of managers under 40 (f_1) and those over 40 (f_2) is different from zero.

This test is based on questions 13 (age) and 7 (perception of digitalization impact on managerial processes). It calculated the empirical distribution and determine the critical value using the Kolmogorov-Smirnov test formula:

$$D_{\text{calculat}} = 0,22$$

$$D_{\text{teoretic}} \cong c(\alpha) \cdot \sqrt{\frac{n_1 + n_2}{n_1 \cdot n_2}} \cong 1,36 \cdot \sqrt{\frac{110}{3025}} \cong 0,26 \quad (5)$$

Where, $c(\alpha) = 1,36$ is a coefficient specific to the chosen significance level $\alpha = 5\% = 0,05$, n_1 and n_2 are the sample sizes.

Analyzing the results, the following inequality holds:

$$D_{\text{calculat}} = 0,22 < D_{\text{teoretic}} = 0,26. \quad (6)$$

Thus, the null hypothesis H_0 is accepted: there is no significant difference between managers under 40 and those over 40 in terms of perception regarding the impact of digitalization on managerial activity.

By applying a structured questionnaire among SME managers from various fields of activity, this research aims to capture how decision-makers perceive digitalization, what the main benefits, challenges, and identified development directions are in practice. This approach allows for a realistic and up-to-date depiction of managerial processes in the digital age, highlighting both the factors that facilitate the adoption of modern technologies and the obstacles encountered in practice.

3. Conclusions

This investigation contributes to a more nuanced understanding of how SMEs adapt to the challenges of the digital era, providing valuable empirical data for formulating practical recommendations and for strengthening the theoretical foundation of the digital management concept. At the same time, the research results can serve as a starting point for future comparative analyses or for expanding the investigation to other types of organizations.

In addition to these aspects, the study highlights the specifics of the Romanian entrepreneurial environment, illustrating how small and medium-sized enterprises respond to global digitalization trends, depending on available resources, technological readiness, and organizational culture. The use of a standardized tool such as the questionnaire enabled the collection of relevant and comparable data, which support the formulation of solid conclusions oriented toward practical applicability. The analysis of the obtained results also allows for the testing of research hypotheses with explanatory value, contributing to the development of concrete directions for accelerating the digitalization process within SMEs. The main conclusions drawn from the study are:

- ❖ 68.2% of SMEs in Romania perceive their performance as significantly improved due to digitalization processes and the use of modern management solutions.
- ❖ Over 60% of SMEs have implemented digital solutions in recent years.
- ❖ More than 65% of managers believe that digitalization contributes to the improvement of both internal and external communication.
- ❖ Over 50% of SME managers consider high costs to be the main barriers to digitalization.
- ❖ More than 60% of managers under the age of 40 are more open to adopting digital technologies.
- ❖ Over 55% of SMEs using CRM (Customer Relationship Management) systems report better performance.
- ❖ More than 65% of managers believe that digitalization supports better strategic decision-making.

All the elements researched in this study were analyzed from an integrated and complex perspective, in order to highlight the relationships between the level of digitalization, organizational structure, managerial style, and the performance of small and medium-sized enterprises (SMEs) in Romania. It is essential to understand digitalization not merely as a technological process, but as a strategic transformation of how SMEs operate and compete in the marketplace.

The interpretation of the results obtained from the conducted study shows that the majority of SME managers perceive digitalization as a competitive advantage, while also highlighting challenges related to the lack of specialized personnel, limited financial resources, and resistance

to change. Moreover, a connection was observed between the manager's age and their openness to digital technologies, with younger managers generally being more receptive to innovation and change.

Although some SMEs continue to face challenges regarding digital infrastructure and the adoption of CRM or ERP solutions, the overall opinions regarding the beneficial potential of digitalization are generally positive. Considering the declared motivation of managers, namely, the desire to streamline processes and improve customer relations, it can be concluded that these views are justified and not merely based on superficial enthusiasm.

Improving the level of digitalization of internal processes, as well as increasing the use of online communication platforms and digital marketing, will significantly contribute to enhancing the competitiveness of Romanian SMEs in an increasingly dynamic and digitalized economic environment.

This research helps managers to see the advantages of the digitalization of the company and to invest in this process, which leads to improved company performance. The study has limitations related to the small number of managers surveyed and was limited to managers from Romania.

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