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**DEVELOPMENT OF THE MANAGEMENT SYSTEM OF
SMALL AND MEDIUM ENTERPRISES THROUGH THE USE
OF INFORMATION TECHNOLOGIES**

521.03 ECONOMICS AND MANAGEMENT IN FIELD OF ACTIVITY

Abstract of the Doctoral Thesis in Economic Sciences

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CONCEPTUAL FRAMEWORK OF THE RESEARCH

Actuality and importance of the problem addressed. The process of emergence of the Republic of Moldova towards a market economic system requires all enterprises to develop the managerial system according to the national strategic priorities. Economic development and the growth of fair competition in all economic sectors in the Republic of Moldova make the managerial system of organizations become the fundamental tool for affirming and achieving the entrepreneurial objectives of managers.

With the influence of external factors, such as the pandemic, the energy crisis, etc., SMEs have faced significant problems and challenges in business management, in an extremely difficult context. At the same time, the management system of SMEs in the Republic of Moldova demonstrated multiple vulnerabilities, a reduced adaptability to the impact of external factors, as well as to the upheavals brought by them.

In the 21st century, the main factor that transformed and reshaped the managerial system of SMEs are information technologies, which, with their implementation within companies, contributed to the significant increase in benefits and competitive advantages within SMEs. In the era of digitalization, every SME manager must resize his management system in the context of the digital transformation of management processes. Information technologies, as catalysts, ensure the company's rapid access to new markets, new values and ensure their strategic development.

As a result, the *topicality of the research topic* derives from the need of SMEs to ensure their viability, to strengthen their position on the market, to increase their competitiveness, which can be ensured through the integration of information technologies in the managerial system. In the era of digitization, the implementation of information technologies becomes a vital necessity that reduces the vulnerability and increases the competitiveness of enterprises. In this context, the research topic is a current one and requires a theoretical-methodological substantiation that will help us identify the characteristics of the modern management system specific to SMEs through the lens of the application of information technologies.

The motivation for choosing the subject. A specific characteristic of small and medium enterprises in the Republic of Moldova is vulnerability. This characteristic is punctuated by the unstable environment, the lack of financial resources, the constantly changing customer preferences, the need to adapt to the different economic situation. In order to overcome the vulnerability of SMEs, we consider it necessary and optimal to apply information technologies in order to effectively anticipate, manage, organize and control the managerial activity of SMEs.

The importance of the research topic is determined, first of all, by the need to increase the competitiveness of SMEs in the Republic of Moldova, which can be ensured through the

implementation of modern information technologies. As a result, information technologies will help businesses restructure their management system to achieve increased business viability. At the same time, on the other hand, studies in this field demonstrate that the implementation of information technologies helps companies to plan and forecast, organize, control and evaluate activities, which gives them increased possibilities to achieve strategic competitiveness. The need to research these elements is a vital one, given the fact that with the integration of information technologies, the quality of the products/services produced/provided by the SMEs in our country will increase, on the one hand, but also the costs of the products/services offered by enterprises will be reduced, on the other hand. At the same time, the companies will have the opportunity to compete with other companies on the EU markets, which will allow them to diversify their market and respectively increase their notoriety and competitiveness. In the 21st century, in the context of the 4.0 revolution, SMEs are required to align their activity approach by integrating information technologies in various stages of the organization's life cycle, a fact that will allow them to compete, not only on the national market, but also on the international one.

Just as, in the last 5 years, the digitization approach through the digital transformation of SMEs in the EU has taken over all sectors of SME activity, businesses in the Republic of Moldova, through its commitments to integration into the EU, are required to align their management systems to European standards. In the context of the previously stated, we consider the research topic as one of increased topicality that needs to be studied through the elucidation of the most effective strategies for integrating information technologies in the activity of SMEs.

This study represents a theoretical-practical substantiation of the fundamental aspects of the development of the SME management system through the integration of modern information technologies that offer the possibility of increasing their competitiveness and stability on the market.

In this context, we find the need to solve the **research problem** that consists in the *theoretical and methodological substantiation of the possibilities of remodelling the management system of SMEs in the context of digitalization*. As a result, we highlight the significant impact of information technologies in the efficiency and improvement of the management system of SMEs.

The extent of the researched topic in the Republic of Moldova is a well-defined one. The subject of the integration of information technologies in the management system of SMEs has been addressed by numerous researchers from abroad, including: P. Drucker, H. Fayol, T. Lynn, S. Gorden, F. Almeida, A. Bartik, F. Candelon, J. Clif, A. Dua, G. Cane, F. Li, O.

Uvarova, H. Aguinis, etc. who directed their research approach in order to elucidate the impact and possibilities of implementing information technologies in business.

In the same context, we highlight the role of studies carried out by researchers from Romania, including: A. Tugui, D. Airinei, D. Homocianu, D. Oprea, A. Ploeanu, A. Grama, M. Filip, D. Fotache, D.-T. Agheorghiesei (Corodeanu), I. Popa, C. Dobrin, etc., who carried out various studies in order to highlight the significant role that information technologies have on the efficiency and improvement of the management system.

At the same time, the studies carried out in the field of information technology integration in the business environment were accomplished by studies carried out by researchers from the Republic of Moldova, including A. Cotelnic, I. Dorogaia, L. Covas, A. Solcan, S. Gorobievschi, I. Costas, L. Bocancea, L. Boboc, M. Bajan, V. Dubac, R. Crudu, etc., who highlighted the importance of information technologies on increasing the efficiency of companies.

The aim and objectives of the research. The purpose of the research *consists in the development of theoretical-methodological approaches to the improvement of the management system of small and medium-sized enterprises in the Republic of Moldova, through the prism of the integration of information technologies.*

Therefore, during the research and studies carried out in this study, we will demonstrate the necessity and usefulness of implementing information technologies in the management system of SMEs in the Republic of Moldova in order to improve the efficiency of managerial processes, strengthen their position on the market and increase their competitiveness.

Although the SMEs have poorly defined management systems with poorly defined functions, however, we believe that information technologies are able to help SMEs optimize their costs, increase their performance, as well as improve their level of quality of the products/services offered to its customers.

To achieve the purpose of the research, we established the following **research objectives**:

O1: researching theoretical-methodological approaches regarding the contribution of information technologies to business development;

O2: evaluation of the performance indicators of the SME sector in the Eastern Partnership, the EU and the Republic of Moldova, in the context of digital transformation;

O3: highlighting the possibilities of making the managerial system of SMEs in the field of car services more efficient;

O4: evaluation of the possibilities of integration of information technologies within the IMM in the field of automotive services;

O5: identifying the strategic directions for improving the managerial system of SMEs in the Republic of Moldova.

Research questions:

According to the content of the research objectives, we determined the *research questions*:

- What is the contribution of information technologies in the SMEs management system?
- What is the value of the performance indicators of SMEs in the EU and the Republic of Moldova in the context of digital transformation?
- What is the level of IT integration in the management system of SMEs in the Republic of Moldova in the field of automotive services?
- What are the solutions for improving the management system of SMEs in the Republic of Moldova in the field of automotive services?
- What are the strategic directions for streamlining the management system of SMEs in the Republic of Moldova in the context of digitalization?

Research hypotheses:

Based on the research objectives and questions, we have established the research hypotheses that we will validate throughout the study:

Hypothesis 1: Information technologies show a positive contribution to the efficiency of the SME management system;

Hypothesis 2: The indicators of the digital transformation of SMEs in the EU register, in the last 3 years, a positive evolution;

Hypothesis 3: The level of IT integration in the management system of SMEs in the Republic of Moldova in the field of automotive services is low;

Hypothesis 4: The optimal solution for improving the SMEs management system from the Republic of Moldova, in the field of automotive services, is the implementation of a specialized software;

Hypothesis 5: The main strategic direction to improve the efficiency of the SME management system in the Republic of Moldova is the implementation of the action plan for the digital transformation of SMEs.

The theoretical support of the study: it is reflected through the consultation of theoretical sources specialized in the research topic. The specialized books in the field of digital economy, management and information technologies constituted the foundation of the theoretical support of the work. On the other hand, the scientific articles from various national and international databases were consulted, such as: Web of Science, Sciendo, EBSCO,

ResearchGate, as well as the articles from the library repositories of higher education institutions in the Republic of Moldova.

Scientific research methodology. In order to be able to research the proposed topic, we resorted to a complex methodology, focusing on the integration of different research methods in the research approach. The theoretical-methodological studies carried out in this paper focus on a multidimensional, complex and deep analysis of the investigated phenomena. At the same time, in order to fulfill the topic, we resorted to various research methods such as: analysis and synthesis, induction and deduction, qualitative and quantitative analysis, scientific abstraction. At the beginning of the research carried out in this paper, we used the theoretical research of the studied phenomena, which was later supplemented with empirical research, quantitative research through the opinion poll, which was based on the questionnaire as a research tool. As a result, the research was completed through documentation, statistical analysis, comparative analysis of the studied phenomena.

In the same vein, we can point out that the theoretical research carried out in this study gave us the opportunity to do a multidimensional analysis, to carry out a complex approach, of the impact of modern information technologies on the efficiency of the managerial system of the SMEs. On the other hand, the theoretical research allowed us to highlight the modification and adjustment of the characteristics of SME management systems in the context of the implementation of information technologies.

The research of statistical data on the experience of the Eastern Partnership countries, the EU in transforming the management systems of SMEs in the digital transformation approach, gave us the opportunity to elucidate the success factors, the experiences of the countries in order to adapt the best practices in the digitization of SMEs of the Republic of Moldova.

In the same context, we would like to highlight the fact that, the quantitative research carried out, the empirical study (S1), allowed us to highlight the opinion of the employees of SMEs in the field of car services in the north of the Republic of Moldova, regarding the possibilities of aligning these Enterprises in digital transformation.

The informational and statistical support of the work: In order to elaborate this study, we resorted to the analysis of the specialized literature from the country but also from abroad on the researched topic, from the last 10-20 years. Also, various laws and decisions, materials, of national and international bodies were analyzed and studied, such as: Decisions of the Government and Parliament of the Republic of Moldova, national and international reports and strategies related to the topic studied, such as: Global Innovation Index Report, The Digital Economy and Society Index (DESI), the Report on shaping the digital future of Europe, the Directive on the security of data and information systems, the “Digital Europe” Program, the

Report of ICT companies from the Republic of Moldova, the Program for the digital transformation of SMEs from the Republic of Moldova, the National Digital Transformation Strategy of the Republic of Moldova 2023-2030, etc., statistical data from Eurostat and other international institutions, as well as from the National Bureau of Statistics, the National Auto Transport Agency. All these sources of information helped us to move forward in the complex research process and to substantiate, with theoretical-applicative data, the studied phenomena.

The solution to the important scientific problem consists in substantiating, from a scientific and methodological point of view, the possibilities of improving the management system of SMEs in the context of the integration of modern information technologies.

Consequently, the results obtained from the solution of the research problem will complete the studies carried out in the given field and will help the SMEs in the Republic of Moldova to step firmly to align the management systems in order to integrate information technologies.

Scientific novelty and scientific originality of the work:

- the complex approach to the improvement of management systems specific to SMEs in the Republic of Moldova in the context of the integration of modern information technologies;
- identifying the most successful methods and strategies that will help SMEs in accelerating the digital transformation process;
- evaluation of the experience of SMEs from the Eastern Partnership and the EU In alignment with the opportunities offered by digital transformation;
- evaluation of the readiness and availability of SMEs from the Republic of Moldova to integrate successful information technologies into the management system;
- development of an informational program - SMARTAUTOSOFT - integrated management system for SMEs in the field of automotive services in order to make business management more efficient;
- the development of an action plan to accelerate the process of digital transformation of SMEs in the Republic of Moldova.

The theoretical importance and the applied value of the work: the theoretical studies carried out in this paper illustrate a valuable contribution for the management of SMEs in the context of accelerating the process of digital transformation of SMEs. The theoretical approach carried out in this paper gave us the opportunity to highlight the essence, the specifics, the characteristics, the success factors in the managerial system of the IMM, but also the changes made in the business management in order to integrate information technologies. On the other hand, the theoretical research allowed us to substantiate models and methods of resizing the management systems of SMEs for the successful integration of information technologies.

The **applicative value** of the work resides in the fact that the research of the efficiency indicators of SMEs in the EU and the Republic of Moldova in aligning the digital transformation approach allowed us to evaluate the preparation of SMEs in the integration of information technologies, on the one hand, but also to we highlight the most effective digital transformation directions for SMEs in the Republic of Moldova.

The documentation and analysis of international reports in the field of business innovation and digitization gave us the opportunity to analyze and evaluate the preparation of the states, from a macroeconomic perspective, in accelerating the digital transformation of SMEs in the sectors of national economies.

In the same context, the quantitative research carried out in this paper gave us the opportunity to evaluate the level of preparation of SMEs in the field of car services in the Republic of Moldova in the integration into the management system of information technologies. At the same time, the research allowed us to identify solutions to improve the efficiency of the SME management system in this sector.

The informational program “SMARTAUTOSOFT” developed by the author of the work in order to improve the management system of SMEs in the field of automotive services allowed the companies in this sector to optimize and digitize their management system, on the one hand, but also to increase their competitiveness.

In the same vein, the recommendations highlighted by the author of the work contribute to the acceleration of the alignment of SMEs from the Republic of Moldova to the approach of digital transformation through the prism of the integration of modern information technologies in business management.

The **results of the research** were implemented within the companies L.L.C. “Slovegrena”, L.L.C. “VIP MOTORS”.

Approval of scientific results. The results of the research were disseminated through publications in the country and abroad, in various specialized journals and in the conference materials, with a total volume of over 9.6 c.a., which include: 3 articles - in the journals of abroad; 2 articles - in national magazines; 5 articles – in the materials of international conferences abroad, 6 articles – in the materials of international conferences in the country.

The results obtained because of the promotion of research in this paper, were disseminated at various symposia and conferences in the country and abroad.

THESIS CONTENTS

Chapter 1 of the work, ***“THEORETICAL-METHODOLOGICAL REFERENCES REGARDING ENSURING THE EFFICIENCY OF THE MODERN MANAGEMENT SYSTEM THROUGH THE USE OF INFORMATION TECHNOLOGIES”***, includes a deep, multidimensional conceptual approach through which the theoretical-methodological analysis of the work was carried out. The research carried out in this chapter gave us the opportunity to complete the conceptual basis of the Enterprise management system through the prism of its alignment with the principles of digital transformation. In the content of the chapter, a multilateral, complex analysis of the digital economy was carried out, highlighting the evolution, influencing factors, advantages and disadvantages of the digital economy. Moreover, the elements and functionality of the digital economy were analyzed (Fig. 1.).

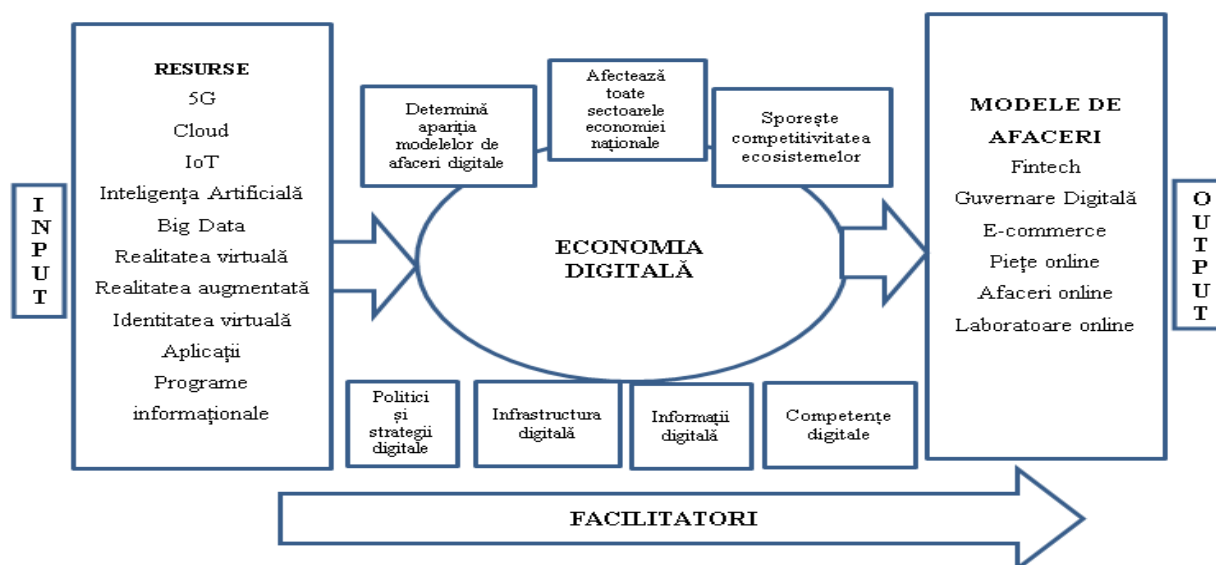


Fig. 1. Elements and functionality of the digital economy

Source: elaborated by the author

According to the data in the figure, we highlight the rise from traditional resources used in business (material, financial, informational, human resources) to modern digital resources, which ensure the functionality of the digital economy. As a result, we emphasize that the main resources that are used in the digital economy are the most modern informational technologies such as 5G, Cloud Computing, IoT, Artificial Intelligence, Virtual Reality, Augmented Reality, Virtual Identity, Applications and informational programs that are used by economic agents in order to produce goods and services that would satisfy the expectations of customers at the highest level, which towards the end, generates new business models, which reshape the global economy.

In addition, the main advantages of the digital economy were reviewed such as: efficiency and effectiveness, global accessibility, rapid innovations, product customization, economies of scale and cost reduction, new business models. At the same time, the main disadvantages of the digital economy were also identified, including remodeling of jobs, dependence on technology, reduction of human interaction, digital inequality, confidentiality, and data security.

In the same context, the characteristics of the digital age were analyzed, through the 4.0 industrial revolution, which is characterized by the development of different information technologies such as Artificial Intelligence, Big Data, electronic identification, 5G, etc. In various sectors of the national economy (Fig. 2.).

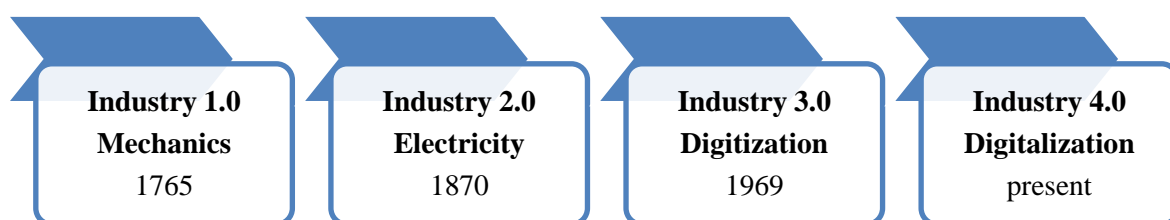


Fig. 2. The stages of industrialization

Source: https://academiaromana.ro/sectii/sectia08_tehnica/doc2018/2018-0926-Banabic-DiscursReceptie.pdf

As information technologies represent the basic resource that remodels and transforms the functionality of the economy, a special place in the research was occupied by research on the digitization of businesses.

Thus, as a result of the research carried out in the work, the concepts of digitization, digital transformation, digitization were analyzed (Table 1.).

Table 1. Digitization, digital transformation, digitalization

Source	Digitization	Digital transformation	Digitalization
Digital transformation program of SMEs from the Republic of Moldova, 2022	Creating a digital representation of physical objects or attributes, moving from manual to digital processes, converting data, documents and processes from analogue to digital	It represents the integration of digital technologies in all the processes of a business, fundamentally changing the way it operates and offers value to its customers.	Facilitating or Improving processes through the use of digital technologies and digitized data, developing a culture of using information technology In the course of business, transforming existing business processes by capitalizing on digital technologies, resulting in opportunities to increase companies' competitiveness
Digital Ecosystem Country Assessment (DECA), 2022	Conversion of data and documents from analogue format to electronic format.	On a large scale, at the organizational level, profound change in multiple work processes and in the organizational culture, determined by the valorization of digital technologies.	Using digital technologies to improve or transform a process or interaction, often increasing productivity and efficiency.

Source: https://gov.md/sites/default/files/document/attachments/subiect-07_nu_-_617_me_site.pdf and <https://www.usaid.gov/sites/default/files/2023-01/Moldova%20DECA%20%28Romanian%29.pdf>

According to the data in the table, we notice that digital transformation refers to a micro-economic approach, related to the implementation of information technologies within

companies, while digitization is a broader concept, a macro-economic one, which boils down to the integration of information technologies in companies. In order to increase the efficiency, performance and competitiveness of companies. Both concepts are based on information, data in digital format, which are obtained due to the digitization of information. As a result, integrated management systems were analyzed, among them: MRP, MRP II, ERP, SAP, CRM.

In the same context, the company's own model of the modern management system was developed through the use of information technologies (Fig.3.).

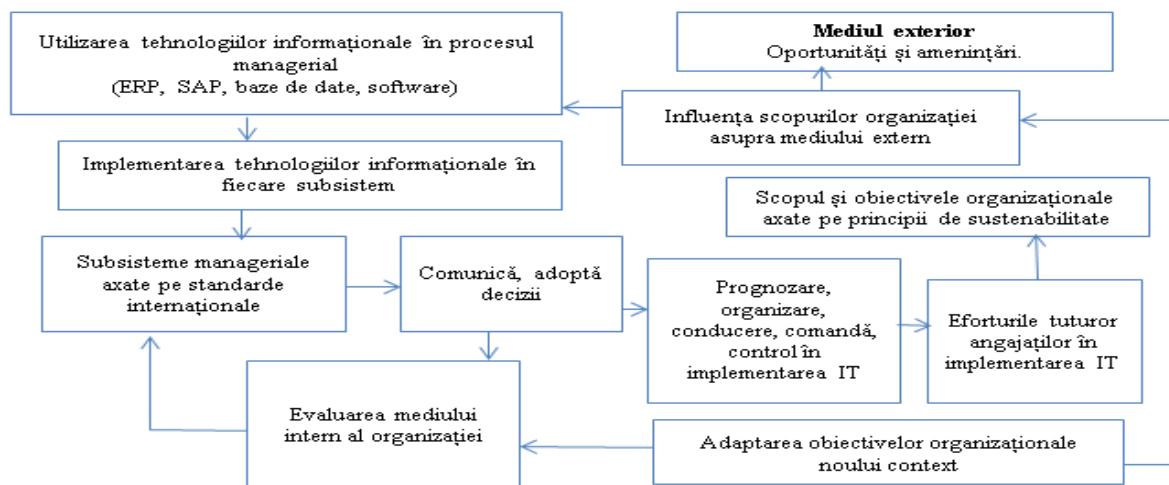


Fig. 3. The model of the modern management system focused on the implementation of information technologies

Source: developed by the author

The research continued with the review of the essence, the content, as well as the main characteristics of the closed management system and the open management system (Table 2). Analyzing the main characteristics of the *Closed management system*, we highlight that the organizations that develop such a managerial system are rigid organizations, with a predominantly internal informational flow, which shows poor communication with the external environment and its business partners. A *closed management system* is a conceptual framework that focuses on the internal functioning of the organization and has a more rigid and hierarchical approach, a reduced level of communication with the external environment of the organization.

On the other hand, an *open management system* is a conceptual framework that recognizes and values the organization's interconnections with its external environment. This system encourages collaboration and interaction with external partners, clients and other organizations to create added value and stimulate innovation. *The open management system* is a flexible system, where information flows are continuous and bidirectional, from top to bottom and bottom to top, ensuring the involvement and stimulation of employees in the development of

the organization. In addition, the open management system encourages creativity and innovation, stimulates cooperation and collaboration between the organization and the external environment.

The development of the digital economy, the explosion of information technologies, along with the amplification of the 4.0 revolution, the complexity of digital flows and platforms, imposes the need for companies to adapt their management systems from classic systems to digital management systems. As a result, the *digital management system* emerges, which is a set of processes, technologies and practices used to organize, plan, monitor and control the activities of an organization, with an emphasis on the use of digital technologies to achieve objectives and optimize business processes (Fig. 4.).

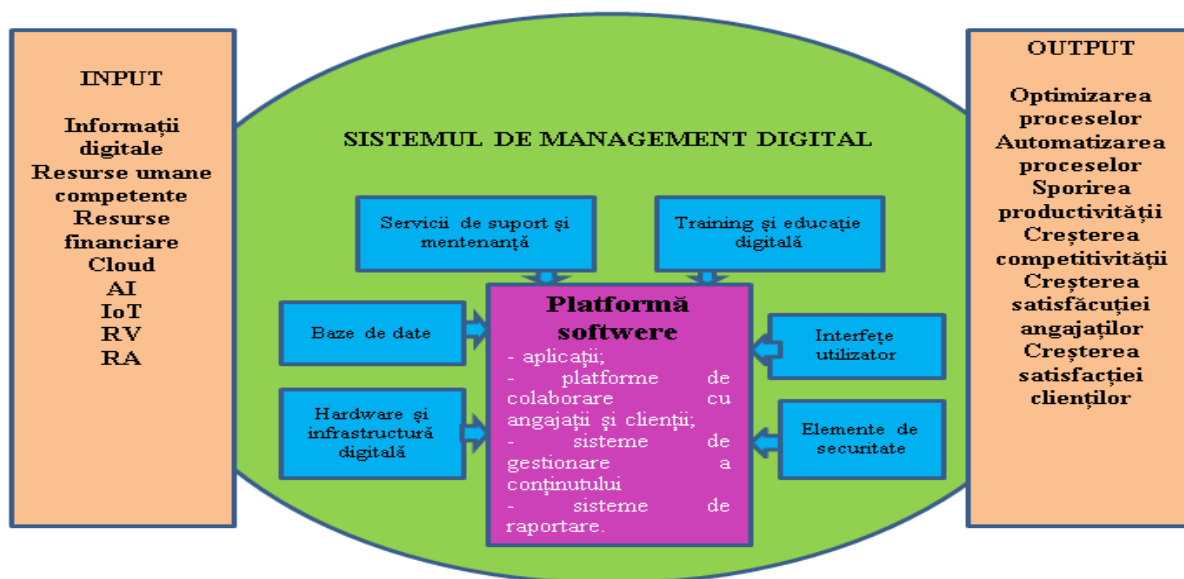


Fig. 4. The structure of the digital management system

Source: developed by the author

Digital management systems offer organizations the opportunity to quickly adapt to customer needs, to integrate and cooperate with the external environment in order to offer attractive products and services.

Chapter 2 of the work, ***“THE SPECIFIC DIGITAL TRANSFORMATION IN THE FRAMEWORK OF SMALL AND MEDIUM-SIZED ENTERPRISES”***, includes the analysis of policies, strategies, factors, actions adopted by the authorities in accelerating the digital transformation process. The chapter begins with the analysis of the impact of the pandemic on the acceleration of the digital transformation process and the measures applied by the countries of the Eastern Partnership, supported by the EU, in order to digitally transform the SMEs.

As a result, ambitious EU strategic objectives were presented to accelerate the digital transformation of EU countries. Thus, in addition to improving the infrastructure through the prism of increased connectivity, 5G penetration, as well as various modern information technologies, the EU has proposed to considerably increase to 90% the use by SMEs of at least a basic level of digital strength,

along with the use of cloud/big data/AI by SMEs at 75%, but also to increase the number of “unicorn” companies in the EU. Also, the EU aims to digitize 100% public services and health services in EU countries.

A special place in the research carried out in this chapter was occupied by the analysis of statistical data regarding the use of information technologies by the SMEs in the EU (Fig. 5.).

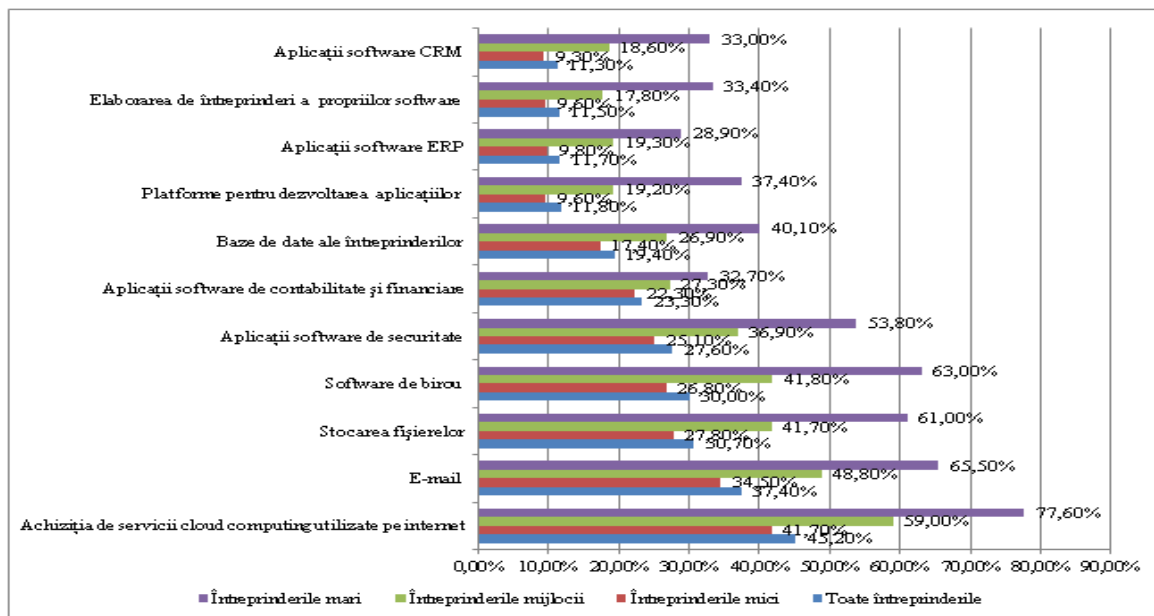


Fig. 5. Implementation of modern information technologies by EU companies, 2023, %

Source: https://ec.europa.eu/eurostat/statistics-explained/images/4/4e/Enterprises_buying_cloud_computing_services%2C_by_type_of_cloud_service_and_size_class%2C_EU%2C_2023_%28%25_of_enterprises%29.png

According to the data in table 1, medium-sized companies in the EU, compared to large companies, register slower progress in the implementation of various modern information technologies in business. Thus, 59% of medium-sized enterprises in the EU purchase Cloud computing, 48.8% use e-mail, and 41.8% have an office software that they use in the digitization of processes. It should be noted that 17.8% of medium-sized enterprises in the EU develop their own software for business and CRM applications are used by only 18.6% of medium-sized enterprises in the EU. In the same vein, small enterprises in the EU register the most modest progress in the implementation of information technologies, compared to other enterprises. Thus, we note the fact that only 26.8% of small businesses have office software, and 17.4% have their own databases. At the same time, we highlight that only 9.4% of small businesses in the EU use CRM applications.

Making an in-depth analysis at the level of the EU states In the successful integration of modern information technologies, we note the fact that the companies from the Scandinavian countries, Finland, Sweden and Norway have aligned the fastest to the digital transformation approach, and are leaders in the EU ranking regarding the successful integration in the business environment of the most modern informational technologies, registering the values of 78%, 72%

and 71% respectively. At the same time, we highlight that the Enterprises from Greece, Romania and Bulgaria, recorded, at the level of 2023, the most modest performances, 24%, 18% and 17%, respectively, in the Integration of new information technologies in their activity.

In addition, the evolution of the DESI indicator (Digital Economy and Society Index) was analyzed, which scores the use of information technologies by SMEs in the EU (Table 2).

Table 2. DESI dynamics in EU SMEs, 2021-2023

Indicator	2021	2022	2023
SMEs with at least a basic level of digital strength	-	55%	69%
Implementation of electronic information	36%	38%	38%
Social media	23%	29%	29%
Integrated data	12%	14%	14%
Cloud	-	34%	34%
The use of multiple information technologies	-	8%	8%
Use of e-invoices	25%	32%	32%
SMEs practicing online commerce	17%	18%	19%
The turnover brought by online commerce	11%	12%	11%
SMEs practice cross-border online commerce	8%	9%	9%

Source: developed based on DESI Reports, 2019-2023

Analyzing the dynamics of DESI for SMEs in the EU, we can see that in 2023 only some of the analyzed sub-indicators recorded spectacular increases. Thus, at the level of 2023, over 69% of SMEs already had information technologies implemented, at least at the basic level of digital intensity. This points out that in the context of the pandemic, SMEs were stimulated to animate their policies and to find financial means to allocate for the development of SMEs through information technologies.

On the other hand, the use of electronic information by EU SMEs has also increased. Thus, if in 2021 electronic information was used by 36% of SMEs, then at the level of 2023, this sub-index increased, reaching the value of 38%. More and more SMEs, over 29% in 2023, use social media to carry out their activities, increasing compared to 2021, when the value of the indicator was 23%. Also, more and more SMEs use e-invoices, where a spectacular increase can be noted in the period 2019-2023, from 25% to 32%. On the other hand, online commerce is used by SMEs in the EU, but at a slower pace, where between 2021-2023, an insignificant increase was recorded from 17% to 18%.

In the same vein, the normative framework, the strategic directions for intensifying the process of digital transformation of SMEs in the Republic of Moldova were analyzed. From the analysis of the existing normative acts in the Republic of Moldova in the field of digitalization, we can mention that our country, at the moment, has the Digital Transformation Strategy of the Republic of Moldova 2023-2030 at the national level, which highlights the strategic objectives assumed in order to accelerate the digital transformation of SMEs According to the Global Innovation Index Reports, the Republic of Moldova, in the period 2014-2023, records a drop in

the positions recorded by the Republic of Moldova from position 43 in 2014 to position 60 in 2023 (Table 3).

At the same time, the country’s position in the “Infrastructure” sub-index improved by climbing 13 positions in the ranking, from position 88, in 2014, to position 75, in 2023. In the “ICT” sub-index, our country climbed three positions, In the period 2014-2023, from position 58, to position 55, In 2023. At the same time, in the “General infrastructure” sub-index, the Republic of Moldova climbed 16 positions in the ranking, from position 111 to position 91, in 2023.

Table 3. The dynamics of the Global Innovation Index and the infrastructure sub-index of the Republic of Moldova, 2019-2023

The name	2019	2020	2021	2022	2023
Global Innovation Index	58	59	64	56	60
3. Infrastructure	88(39.4)	88(35.4)	82(36.8)	84(38,3)	75(37,3)
3.1. Information and communication technologies (ICT)	52(72.3)	61(69.0)	62(68.0)	68(72,2)	55(73,4)
3.2. General infrastructure	115(21.5)	112(18.3)	95(22.2)	102(21,3)	91(19,5)

Source: developed based on Global Innovation Index reports, 2019-2023. Available at:

<https://www.wipo.int/edocs/pubdocs/en/wipo-pub-2000-2023-en-main-report-global-innovation-index-2023-16th-edition.pdf>

If we were to analyze the digitalization of SMEs in the Republic of Moldova, we can mention that only 17% of SMEs implement digital technologies in their activity. Thus, there is a need to intensify the support measures granted by the Government, the ODA, the strategic partners of the Republic of Moldova, in order to accelerate the digitization process of SMEs in the country. A large majority of SMEs do not have the experience, financial means, expertise necessary to implement advanced digital technologies. Thus, staff training in the use and implementation of information technologies would be a solution for SMEs.

In chapter 3 of the work, ***“RESIZING THE MANAGEMENT SYSTEM OF SMALL AND MEDIUM-SIZED ENTERPRISES THROUGH THE INTEGRATION OF INFORMATION TECHNOLOGIES”***, the practical part of the work was substantiated, through the prism of promoting empirical studies. The chapter begins with the presentation of the results obtained from the promotion of the empirical study (S1). The respondents of the research were SME managers from the north of the Republic of Moldova in the field of automotive services (CAEM 7120- Technical testing and analysis activities and CAEM 4520 - Maintenance and repair of motor vehicles.), who were kind enough to answer the questions of the questionnaire. The research sample consisted of 103 respondents. As a result of the quantitative research carried out, we can conclude that the SMEs participating in the study are aware of the need to intensify the digital transformation of businesses, because they highlighted that the implementation of

information technologies is the main factor in the efficiency of the management system. At the same time, although most of the SMEs participating in the study are ready to implement new information technologies in the next 1-3 years, they still encounter multiple problems and challenges such as the lack of financial resources in the implementation of new information technologies, the lack of personnel training, lack of managers' interest in implementing new information technologies. These problems require a solution as soon as possible through the preparation of an action plan, within SMEs, regarding the digitization of businesses, which would identify the areas within the business that are to be digitized in the next 1-3 years, the measures that require be achieved, the financial means that must be applied as well as the responsible persons.

In the research respondents' opinion, the elements that must be developed and successfully implemented within SMEs, in order to make the management system more efficient, are the implementation of information technologies noted by 75% of the respondents, the development of innovations, with 27% of the respondents and the application working in a team, with 18% of the respondents. So, following the interpretation of the answers received from the research respondents, we reiterate the fact that the main factor that positively influences the development of the management system of SMEs is the implementation of information technologies and the digitization of the business. Following the research carried out, we can see that the management tools applied by the managers of SMEs in the field of automotive services are varied, which focus on the application of well-thought-out methods that help the efficient management of the Enterprise. Thus, most of the respondents, 63.1%, noted that managers apply the method of management by objectives, and only 17.4% noted the method of management by projects (Fig. 6.).

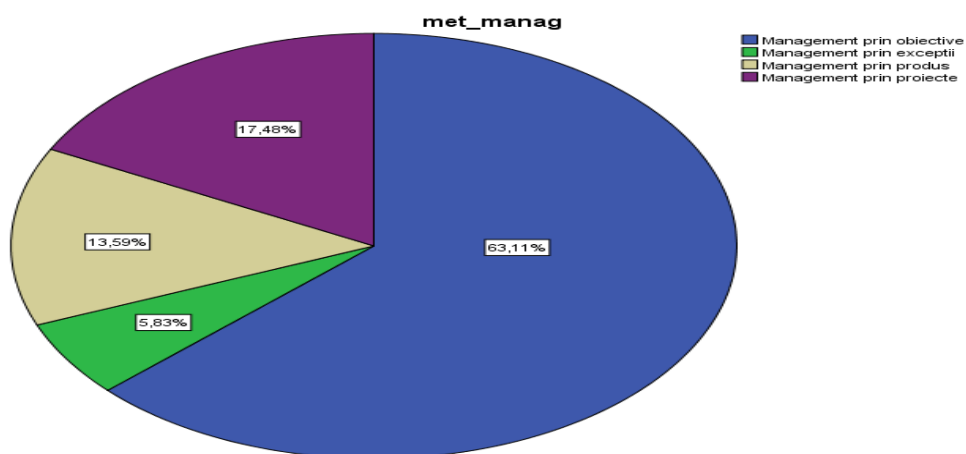


Fig. 6. Managerial methods applied within the SMEs participating in the research

Source: developed by the author in the SPSS program

II: The main management method applied in the IMM in the field of automotive services is management by objectives. According to the obtained results, the first hypothesis is confirmed. Applying the management methodology that helps them achieve the proposed objectives and effectively manage the SMEs, the managers of the SMEs participating in the study, sometimes involve the employees in the decision-making process within the company, a fact noted by 52.4% of the research respondents. However, 15.5% of the research respondents noted that managers do not involve them in the decision-making process within the Company (Fig. 7).

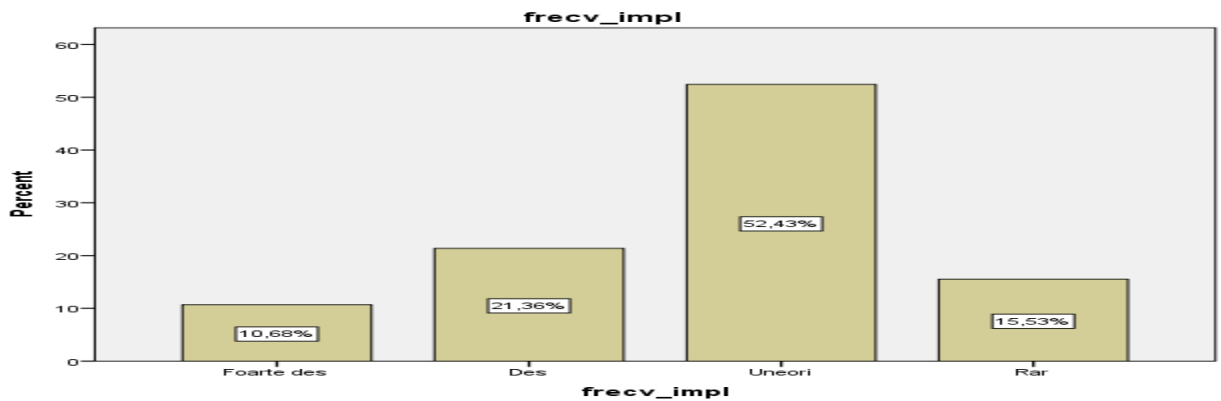


Fig. 7. The frequency of employee involvement in the decision-making process

Source: developed by the author in the SPSS program

In the opinion of the research respondents, the elements that must be developed and implemented successfully within SMEs, in order to make the management system more efficient, are the implementation of information technologies noted by 36.9% of the respondents, the implementation of innovative strategies, by 45.6% among the respondents, the consolidation of employee training In various projects and, the consolidation of the Company’s values and cultures, with 8.7% of the responses (Fig. 8.). Therefore, following the interpretation of the answers received from the research respondents, we reiterate the fact that the main factor that positively influences the development of the management system of SMEs is the implementation of information technologies and the digitization of the business.

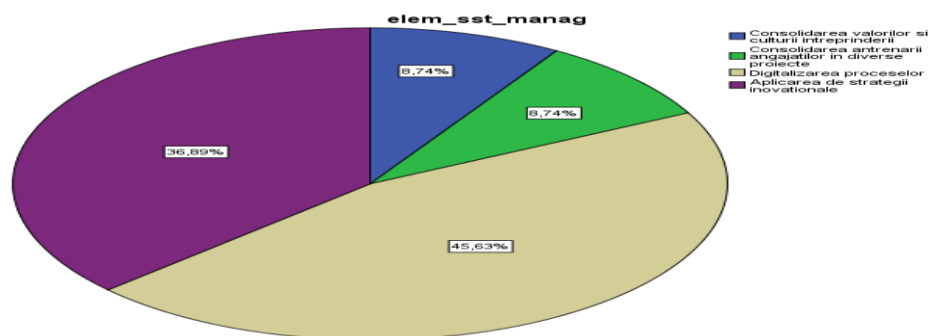


Fig. 8. Elements that require development in the management system of the analyzed SMEs

Source: developed by the author in the SPSS program

Based on the results obtained *I2: information technologies have a positive influence on the efficiency of the management system of SMEs. This hypothesis is confirmed, because the response aimed at the implementation of information technologies within the management system has accumulated 36.9%.*

In the same context, 100% of the research respondents noted that information technologies have a positive influence on the management system of SMEs. Thus, the managers of SMEs must pay more attention to the digitalization process of the business, and access projects, grants for the implementation of new information technologies in business activity.

Although more than 92.2% of the companies participating in the study noted that company managers have acquired new information technologies in the last 5 years, the companies still do not implement advanced technologies that could make the management system of the companies more efficient. Among the most frequently applied information technologies are the computers that are owned by all the SMEs participating in the study, there are specialized software for accounting records, noted by 49% of the research respondents, specific software for the activities of car testing companies, noted by 23.3 % of respondents, who help employees carry out their activities and serve their clients at the highest level. However, we note the fact that such informational technologies as Big data, Artificial Intelligence, Cloud Computing, are less often implemented within SMEs, a fact that hinders the possibilities of business development in this field (fig. 9). In this context, we consider it necessary and opportune to implement advanced informational technologies within SMEs that will favor the increase of their performances.

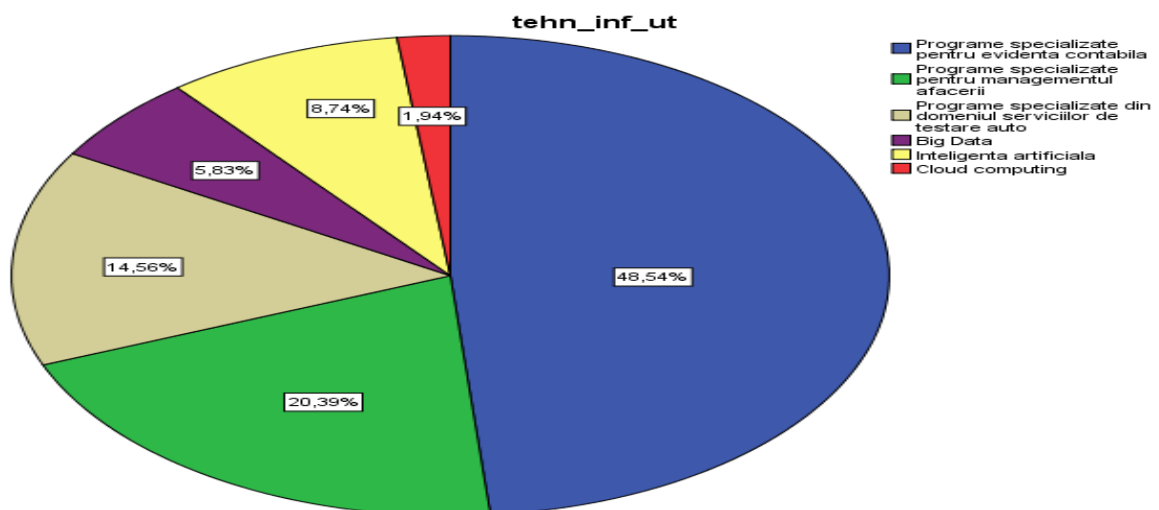


Fig. 9. Information technologies used in SMEs

Source: developed by the author in the SPSS program

Based on the results obtained, *I3: the main information technologies applied by SMEs in the field of car services are accounting software elements, it is also confirmed.*

The main problems encountered by SMEs in the country to digitize their businesses are presented in Fig. 10. Analyzing the data in the figure, we notice that the most important problem highlighted by 33% of the research respondents is the financing of the acquisition of new technologies, as well as the insufficiency of financial sources, noted by 29.1% of the research respondents. At the same time, a problem that persists within SMEs in their digitization process is the insignificant support of the state in the implementation of new technologies, noted by 18.4% of the survey respondents. Therefore, we observe that although the ODA offers grants and support for the training of SME managers and employees in the use of various informational technologies, SME employees are of the opinion that the state and state organizations do not provide support to entrepreneurs.

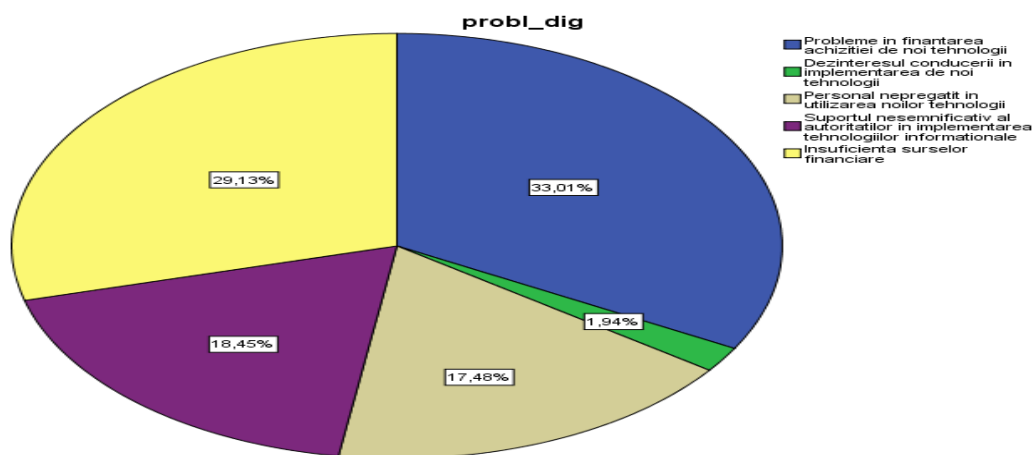


Fig. 10. Problems in the digitization of SMEs in the country

Source: developed by the author in the SPSS program

In accordance with the results obtained, *I4: the main problem in the digital transformation of SMEs is the lack of financial resources, is also confirmed.*

In the opinion of the research respondents, the measures that would help SMEs in the digital transformation are shown in Fig. 11. Thus, to intensify the process of digital transformation of SMEs, it is necessary to carry out multiple measures, among which the acceleration of the implementation of information technologies, noted by 34% of the respondents, as well as another imperative measure is to increase investments in the human capital of employees in order to accumulate new IT skills, noted by 31% of the research respondents. It is also necessary to implement measures such as the consolidation of the state's contribution to the digital transformation of SMEs and the consolidation of the contribution of international bodies to the digital transformation of SMEs, noted with 11.7% each. On the other hand, it is still necessary to improve, within SMEs, the managerial strategy in the context of digital transformation, noted by 8.7% of the respondents. Based on the results obtained, *I5: In*

order to make the process of digital transformation of SMEs more efficient, it is necessary to develop the digital skills of the staff of the SMEs, is confirmed, because the answer that confirms the need to perfect the staff in the use of information technologies is the most popular.

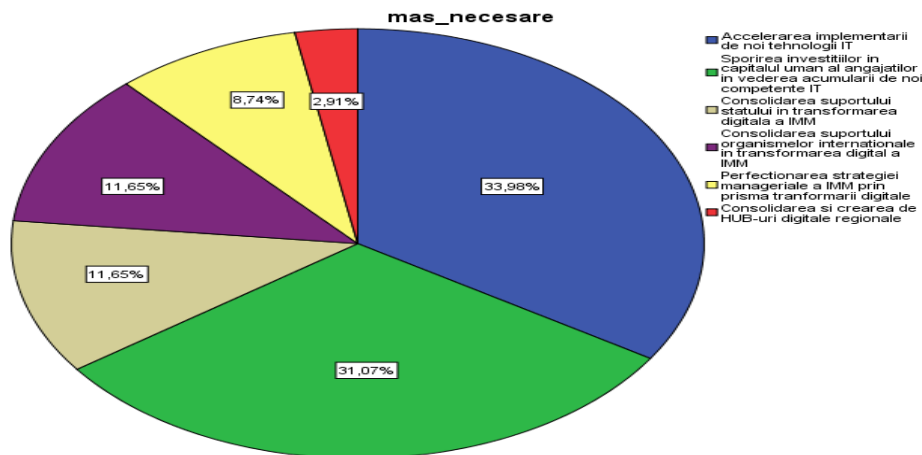


Fig. 9. Measures to improve the efficiency of the digital transformation of SMEs

Source: developed by the author in the SPSS program

As a result of the research carried out in this work, *an information program “SMARTAUTOSOFT” was developed* for SMEs in the field of automotive services, but which can be adapted by SMEs in different fields of activity, intended to help improve the management system through the infiltration of information technologies. Thus, the developed software can be implemented in every SME in the field of automotive services and will help companies in this field in the digitalization of the managerial system. The software provides for the improvement of company management, offering the possibility of digitizing human resources management activities, marketing, logistics, relational management, supply, etc. The application of the software simplifies and streamlines the activity of SMEs, as well as allows the increase of Registered performances, through the lens of perfecting relations with clients and increasing their satisfaction.

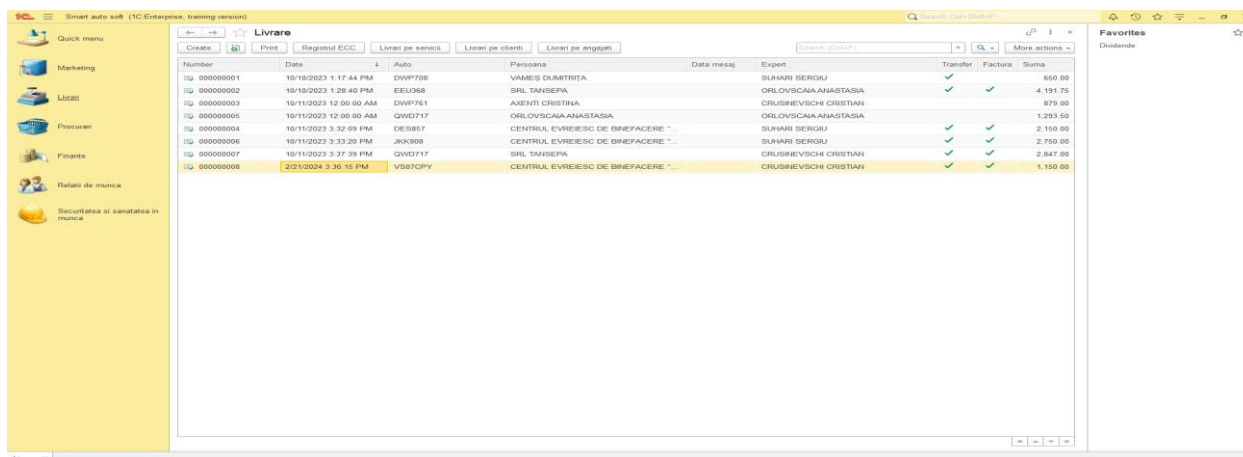


Fig. 10. The interface of the informational program “SMARTAUTOSOFT”

Source: developed by the author

As a result of the studies carried out, we highlight multiple *problems* faced by SMEs in our country in the digitization process: financial difficulties in order to digitize businesses, low digital skills, low understanding on the part of managers in the implementation of information technologies, insufficient external partnerships, insufficient knowledge regarding the grants offered In order to digitize, insufficient support from the authorities In the digitization process, the digital culture is poorly defined.

To improve the managerial system of SMEs in the Republic of Moldova and to solve the problems faced by SMEs in the country in the digitalization process, an action plan was developed to help SMEs align their strategic objectives with the transformation process digital. The action plan provides four strategic objectives with actions and expected results obtained that the car testing companies can obtain with its implementation (Fig. 11.).

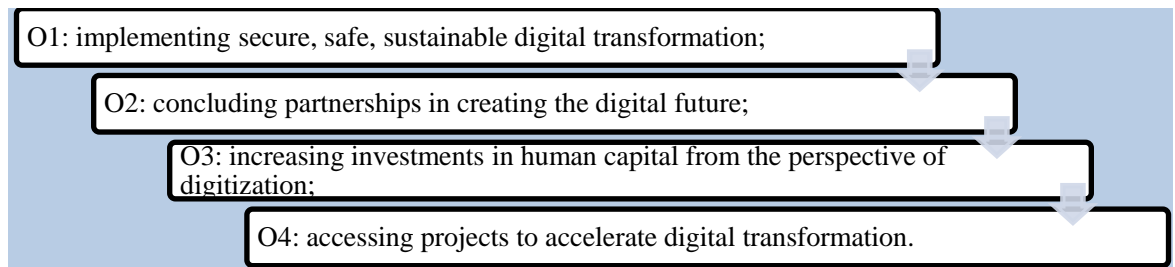


Fig. 11. The strategic objectives of the action plan in order to accelerate the process of digital transformation of SMEs in the Republic of Moldova

Source: developed by the author

The action plan raises awareness of the need for digital transformation within the country's SMEs, on the one hand, but also supports the digitalization process of SMEs by elucidating the activities and the multiple benefits generated by its implementation. At the same time, in order to multiply the effects of the action plan, it is necessary to consolidate the efforts of all the actors involved, in order to be involved in achieving the strategic objectives. Thus, every SME manager must get involved in achieving strategic objectives, a fact that will allow him to capitalize on multiple opportunities generated by the digitalization of the business, as well as to become a competitive business, not only on the national market, but also on the international one.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

The theoretical-methodological research and empirical studies carried out in this thesis allowed us to reach the following *conclusions*:

1. 1. Conceptual approaches, premises, as well as factors, advantages and disadvantages of the development of the digital economy were researched (**paragraph 1.1., paragraph 1.2.**).

2. *The own model of the Modern Management System was developed in the context of the use of information technologies.* The model is an open one, focused on the Sustainable Development Goals (SDGs), given the fact of establishing sustainable organizational goals, focused on principles of efficiency and economic performance. At the same time, the model involves a systemic approach, because it involves all subdivisions in the successful implementation of information technologies in its activity. The model is a flexible and adaptive one that is easy to implement in small and medium-sized organizations to achieve sustainability and organizational performance through digital transformation (**paragraph 1.2.**).

3. The management system specific to SMEs was researched. The Closed managerial system, the open system and the digital managerial system were reviewed. Moreover, following the research carried out, we highlight the fact that the successful managerial model of small and medium enterprises, which activates in the 21st century, in the context of the 4.0 revolution, as well as in the context of multiple innovative changes, is an “adaptive” one, because the companies in this sector require permanent adaptation, being extremely vulnerable to external influences (**paragraph 1.3.**).

4. An analysis of the policies, strategies, factors, actions adopted by the authorities in accelerating the digital transformation process was carried out. The digital transformation measures applied by the Eastern Partnership countries, which are supported by the EU, were reviewed. At the same time, researching the international reports on the digitization of SMEs in the EU, we notice that the Nordic countries are leaders in this chapter, while Bulgaria, Hungary, Romania occupy the last positions in the ranking. Although Romania, annually, prepares qualified specialists in the field of ICT, however, their insertion on the labor market is not significantly reflected. Thus, Romania occupies the last position in the ranking of digitalization of SMEs in the EU. Practically, all analyzed indicators are below the EU average (**paragraph 2.2.**).

5. The normative framework, the strategic directions, the action plans applied by the Republic of Moldova on the digitalization dimension of SMEs were analyzed. As a result of the analysis, we reiterate that only 17% of SMEs implement digital technologies in their activity. The research carried out allows us to highlight that a large part of the SMEs in the country do not have the experience, financial means, expertise necessary to implement advanced digital

technologies. As a result, there is a need to intensify the support measures granted by the Government, the ODA, the strategic partners of the Republic of Moldova, in order to accelerate the digitization process of SMEs in the country (**paragraph 2.3.**).

6. An analysis of the development of SMEs in our country was carried out from the perspective of the integration of information technologies. In this context, we reiterate that SMEs from the Republic of Moldova are very reluctant to integrate information technologies, especially automated management systems. The factors that influence this reluctance are multiple, but the most important factors are the lack of financial means necessary for the acquisition of information technologies, on the one hand, but also unprepared personnel for the use of information technologies.

7. The empirical study S1 was carried out, and as a result of the quantitative research carried out, we can conclude that the SMEs participating in the study are aware of the need to intensify the digital transformation of businesses, because they highlighted that the implementation of information technologies is the main factor in the efficiency of the management system. At the same time, although most of the SMEs participating in the study are ready to implement new information technologies in the next 1-3 years, they still encounter multiple problems and challenges such as the lack of financial means in the implementation of new information technologies, the lack of personnel training, lack of managers' interest in the implementation of new information technologies. These problems require a solution as soon as possible through the preparation of an action plan, within SMEs, regarding the digitization of businesses, which would identify the areas within the business that are to be digitized in the next 1-3 years, the measures that require be achieved, the financial means that must be applied as well as the responsible persons. Besides this, it is necessary to apply effective digitalization measures such as the opening of territorial digital transformation agencies that would help entrepreneurs in the acquisition, installation, use of information technologies for their business (**paragraph 3.1.**).

8. An *informational program "SMARTAUTOSOFT"* was developed, which represents an automated management system that aims to make the managerial system of SMEs more efficient. The software is developed for car service companies, but can be adapted by each SME, intended to help improve the management system through the integration of information technologies. The software provides for the improvement of the management of SMEs, offering the possibility of digitizing the activities of human resources management, marketing, logistics, relational management, supply, etc. The application of the software simplifies and streamlines the activity of insurance and car testing companies, as well as allows the increase of Registered performances, through the lens of perfecting relations with clients and increasing their satisfaction (**paragraph 3.2.**).

9. As a result of the complex research approach, an action plan was developed to help SMEs from the Republic of Moldova in aligning their strategic objectives with the digital transformation approach. The action plan provides four strategic objectives, which include actions and expected results obtained that SMEs could obtain with its implementation. The action plan complies with the objectives and international standards of digital transformation and is based on the principles of cultivating information technology for citizens through the foundation of a digital future at the level of society (**paragraph 3.3.**).

The limits of our research are:

- carrying out quantitative research exclusively within SMEs in the field of car services in the north of the country, which can be extended to other areas of activity of SMEs;
- the small sample of respondents to the research, which, in our opinion, can be increased by integrating more automotive service SMEs in the country;
- conducting quantitative research without being complemented by some qualitative research, such as interviews with SME managers, which in our opinion could complement the results obtained.

As a result of the research carried out, in order to accelerate the process of digital transformation of SMEs, we highlight some *recommendations*:

To the central and local public administration:

1. ***Creation of regional ICT business HUBs*** – as the creation of IT products becomes a problem for the administration of SMEs, there is a need to create regional hubs that would support the digital transformation of SMEs. Thanks to competent staff on the IT dimension, hubs can help SMEs create IT products and digitize businesses. In order to support SMEs in digital literacy and the integration of information technologies, there is a need to create IT hubs, in all regions of the country, which could provide software development and implementation services, as well as digital training of SME employees, in order to accumulate digital skills. This will help the exchange of experience between digital entrepreneurs and other SMEs, on the one hand, but also the efficiency and acceleration of the digital transformation of SMEs throughout the country.

2. ***Financing or tax exemption for IT start-ups*** – In order to stimulate and intensify investments in business digitalization, we consider it necessary to finance IT start-ups or grant exemptions for SMEs that invest in business digitalization. As a result, more IT start-ups will be able to be created, on the one hand, but also digitized SMEs, on the other hand.

3. ***Intensification of investments in the digitalization of SMEs*** – as one of the most important problems in the digitalization of SMEs in the Republic of Moldova is the lack of financial means, there is a need to offer more investment programs for the digital transformation

of SMEs, which would support the renovation of the digital infrastructure. Amplification of investments in the process of digitizing the country's business environment, it can support SMEs in aligning with the digital transformation process, on the one hand, but also in increasing the competitiveness of Enterprises, on the other hand.

4. *Stimulating IT companies for the sale of “products” on the national market* – IT companies from the Republic of Moldova have partnerships with IT companies abroad and export their products. From the analysis carried out, we highlight the fact that SMEs in the country also need IT solutions for the digital transformation of companies. Thus, there is a need to raise awareness, motivate IT companies to sell their products on the national market as well, through agreements signed with SMEs.

5. *Organization of fairs, exhibitions, business software competitions* – In the context of the digital transformation of SMEs, there is a need for specialized software solutions that would help companies in the digitalization process. Thus, it is necessary to organize contests, fairs, exhibitions of IT products that would stimulate the purchase of IT products by SMEs and would support SMEs in their digital transformation process.

To higher education institutions:

6. *Organization of ICT courses for SME employees* – Based on the studies carried out in this paper, we have identified that one of the factors that reduce the speed of digital transformation in the business environment is the lack of knowledge, skills, and digital skills of SME employees. In this sense, we consider it opportune for higher education institutions to organize IT courses for SME employees. At the same time, there is a need to sensitize SME managers in the involvement and motivation of their employees in the process of digital literacy (with the payment of all necessary fees, courses, trips, etc.) and the development of digital skills. This will help to increase the notoriety, competitiveness and performance recorded by SMEs from the Republic of Moldova.

7. *Intensification of the training of IT specialists* – In order to accelerate the digital transformation of SMEs, there is a need for ICT specialists who would support them to successfully integrate and use information technologies. Thus, it is necessary to sensitize young people to choose an ICT profession, on the one hand, but also to increase the number of budgetary places in Higher Education institutions for these specialties. This will support the relaunch of the supply of competent ICT specialists who could be integrated within SMEs.

To the administration of IT companies:

8. *Development and Registration of own IT products* – Based on the research carried out, we have identified the situation that IT Companies develop software products, but which are not Registered. This reduces the possibilities of capitalizing on the advantages generated by them. In

order to accelerate the digital transformation of SMEs, there is a need to register and create their own IT product offers to SMEs.

9. *Development and marketing of IT products on the local market* – as most of the production of IT companies is directed to export, in the context of the digital transformation of SMEs, there is a need to raise awareness, stimulate IT companies to offer IT products for SMEs in the country. This will accelerate the process of digital transformation of SMEs.

10. *Intensification of collaboration with higher education institutions* – In order to increase the competitiveness of IT companies, we consider it necessary to intensify cooperation with higher education institutions, to train qualified IT specialists who will be able to face the challenges of the labor market. As a result, it will be possible to obtain an increase in the competitiveness of IT specialists, who could be integrated within SMEs, on the one hand, but also an increase in the competitiveness of IT companies, on the other hand.

To the administration of SMEs:

11. *Consolidation of the digital infrastructure within SMEs* – the studies carried out point out that the outdated ICT infrastructure is another factor that stagnates the acceleration of digital transformation in SMEs. In this sense, we consider it necessary to increase the investments of SMEs in the consolidation of the digital infrastructure. The purchase of computers, specialized software, the use of programs and applications can help SMEs to accelerate the digital transformation process;

12. *Implementation of IT products in the management of SMEs* – just as the management process of an SME implies the realization of its functions through a systemic and systematic vision of the company manager, we consider that the implementation of IT products in the management of SMEs can help the company in making the managerial process more efficient, on the one hand, but also in increasing SME competitiveness, on the other hand.

13. *The foundation of digital culture within the Enterprises* – as culture is an element of the managerial system of SMEs and a pillar of the viability of the Enterprise, we consider that the administration of SMEs must establish and develop the digital culture within the Enterprises through the digitization of information and the digitization of processes within the Enterprises. The transition from the holographic to the electronic signature, from physical to electronic registers, to the storage of information in digital format, to the creation of company registers and databases, the development of specialized applications and software, which represent steps that must be cultivated through the prism of the SME activity regulations. The development of digital culture will strengthen the necessary values and contribute to the acceleration of the digital transformation of SMEs.

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2. Articles in scientific journals

2.2. In magazines from other databases accepted by ANACEC (indicating the database)

1. COZNIUC, Octavian, SUSLENCO, Alina, DONCEAN, Marilena. *Technologies implemented in the business environment – smart pillar for enhancing organisational performance*. In: CES Working Papers, Iasi, UAIC, 2022, Vol. XIV, issue 4, pp. 333-353, ISSN 2067-7693, 1,2 c.a. Available at: https://ceswp.uaic.ro/articles/CESWP2022_XIV4_SUS.pdf

2. COZNIUC, Octavian, SUSLENCO, Alina. *Improving the modern management system through the use of information technologies*. In: "Economia contemporana", Independenta economica publishing, 2022, vol.7, nr.4, pp. 171-177, ISSN 2537-4222, 0.7 c.a.

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3. SUSLENCO, Alina, COZNIUC, Octavian. *Information technologies – a vital factor of the modern management system in the framework of SME*. In: "Economia contemporana", Pitesti, Independenta economica publishing, 2023, vol.8, nr.2, p. 54-64, ISSN 2537-4222, 0.7 c.a. Available at: http://www.revec.ro/images/images_site/articole/article_28b1119aa2a2944597195cd8d539c913.pdf

2.3. In magazines from the National Register of professional magazines (with category indication)

4. COZNIUC, Octavian, SUSLENCO, Alina. *Perspectivetele utilizarii tehnologiilor informationale In cadrul Intreprinderilor mici si mijlocii din Uniunea Europeana*. In: Revista „Economica”, Chisinau, ASEM, 2022, nr. 4(122), pp. 89-107, ISSN 1810-9136, 0.85 c.a.

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3. Articles in the proceedings of conferences and other scientific events

3.2. In the works of scientific events included in other databases accepted by ANACEC

6. SUSLENCO, Alina, COZNIUC, Octavian. *Sporirea eficientei organizationale in cadrul Intreprinderilor mici si mijlocii din Moldova prin prisma redimensionarii sistemului managerial In contextul crizei pandemice*. In: Conferinta stiintifica internationala „Dezvoltarea economico-sociala durabila a euroregiunilor si a zonelor transfrontaliere”, Materialele Conferintei Stiintifice Internationale din 29 octombrie 2021, Iasi, Performantica, vol. 40, 2021, pp. 503-509, ISBN 978-606-685-831-1, 0,75 c.a. Available at: https://ibn.idsi.md/ro/vizualizare_articol/144833

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Conferinta stiintifica internationala „Статистичні методи та інформаційні технології аналізу соціально-економічного розвитку”, Materialele Conferintei Stiintifice Internationale din 01 iunie 2023, Ukraine, Hmelnitk, 2023, pp. 87-97, ISBN 978-617-7572-63-2, 0.75 c.a. Available at: <https://zenodo.org/record/8228683>

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ADNOTARE

Cozniuc, Octavian. „Dezvoltarea sistemului de management al întreprinderilor mici și mijlocii prin utilizarea tehnologiilor informaționale”.

Teză de doctor în științe economice, specializarea 521.03 - Economie și management în domeniul de activitate, Chișinău, 2024.

Structura tezei: adnotare, introducere, trei capitole, concluzii generale și recomandări, bibliografie din 230 de titluri. Conținutul lucrării este expus în 142 de pagini text de bază până la bibliografie, 34 tabele, 68 figuri, 12 anexe.

Rezultatele obținute au fost publicate în 16 de lucrări științifice.

Cuvinte-cheie: management, sistem de management, metode de management, întreprinderi mici și mijlocii, tehnologii informaționale, revoluția 4.0, tehnologii informaționale în afaceri.

Scopul cercetării constă în dezvoltarea abordărilor teoretico-metodologice ale perfecționării sistemului de management al întreprinderilor mici și mijlocii din Republica Moldova, prin prisma integrării tehnologiilor informaționale.

Obiectivele cercetării: cercetarea abordărilor teoretico-metodologice privind aportul tehnologiilor informaționale asupra dezvoltării afacerilor; evaluarea indicatorilor de performanță ai sectorului IMM din parteneriatul estic, UE și Republica Moldova, în contextul transformării digitale; evidențierea posibilităților de eficientizare a sistemului managerial al IMM din domeniul serviciilor auto; evaluarea posibilităților de integrare a tehnologiilor informaționale în cadrul IMM din domeniul serviciilor auto; identificarea direcțiilor strategice de perfecționare a sistemului managerial al IMM din Republica Moldova.

Noutatea și originalitatea științifică: constă în abordarea complexă a perfecționării sistemelor de management specifice IMM-urilor din Republica Moldova în contextul integrării de tehnologii informaționale moderne; identificarea celor mai reușite metode și strategii care vor ajuta IMM-urile în accelerarea procesului de transformare digitală; evaluarea experienței IMM-urilor din parteneriatul estic și UE în alinierea la oportunitățile oferite de transformarea digitală; evaluarea pregătirii și disponibilității IMM-urilor din Republica Moldova de a integra tehnologii informaționale de succes în sistemul de management; elaborarea unui program informațional SMARTAUTOSOFT un sistem integrat de management pentru IMM-urile din domeniul serviciilor auto în vederea eficientizării managementului afacerii; elaborarea unui plan de acțiuni pentru accelerarea procesului de transformare digitală a IMM-urilor din Republica Moldova.

Rezultatele noi obținute constau în dezvoltarea abordărilor teoretice privind perfecționarea sistemului de management al IMM-urilor în contextul integrării de noi tehnologii informaționale. Totodată, a fost elaborat un program informațional pentru managementul IMM-urilor din domeniul serviciilor și un plan de acțiuni pentru accelerarea transformării digitale a IMM-urilor din Republica Moldova.

Soluționarea problemei științifice importante constă în fundamentarea, din punct de vedere științific și metodologic, a posibilităților de perfecționare a sistemului de management al IMM-urilor în contextul integrării tehnologiilor informaționale moderne.

Semnificația teoretică: cercetarea realizată formează o contribuție valoroasă pentru știința managerială în contextul accelerării procesului de transformare digitală a IMM-urilor.

Valoarea aplicativă: este redată prin prisma faptului că, rezultatele obținute în prezenta lucrare pot fi utilizate pentru a accelera procesul de transformare digitală a IMM-urilor prin luarea în considerare a rezultatelor obținute de autorul lucrării de pe urma promovării cercetării cantitative. Totodată, implementarea planului de acțiuni elaborat de autorul lucrării și a programului informațional „SMARTAUTOSOFT” oferă posibilitatea de a perfecționa demersul de transformare digitală a IMM-urilor din Republica Moldova.

Implementarea rezultatelor științifice: rezultatele obținute în cadrul lucrării au fost implementate în cadrul întreprinderilor S.R.L. „Slovegrena”, S:RL., „VIP MOTORS”.

АННОТАЦИЯ

Кознюк, Октавиан. „ Развитие системы управления малым и средним бизнесом посредством использования информационных технологий ”.

Диссертация доктора в экономике, Кишинев, 2024.

Структура диссертации: аннотация, введение, 3 главы, выводы и рекомендации, библиография – 230 источников. Содержание диссертации представлено на 142 страницах основного текста до библиографии, 34 таблиц, 68 фигур, 12 приложений.

Результаты исследования отражены в 16 научных работах.

Ключевые слова: менеджмент, система управления, методы управления, малые и средние предприятия, информационные технологии, революция 4.0, информационные технологии в бизнесе.

Цель исследования заключается в разработке теоретико-методологических подходов к совершенствованию системы управления малыми и средними предприятиями Республики Молдова, через призму интеграции информационных технологий.

Задачи исследования: исследование теоретико-методологических подходов относительно вклада информационных технологий в развитие бизнеса; оценка показателей эффективности сектора МСП в странах Восточного партнерства, ЕС и Республики Молдова в контексте цифровой трансформации; освещение возможностей повышения эффективности системы управления МСП в сфере автосервиса; оценка возможностей интеграции информационных технологий в рамках ИММ в сфере автомобильных услуг; определение стратегических направлений совершенствования системы управления МСП в Республике Молдова.

Научная новизна и оригинальность исследования: заключается в комплексном подходе к совершенствованию систем управления, характерных для МСП в Республике Молдова, в контексте интеграции современных информационных технологий; определение наиболее успешных методов и стратегий, которые помогут МСП ускорить процесс цифровой трансформации; оценка опыта МСП стран Восточного партнерства и ЕС в сопоставлении с возможностями, предлагаемыми цифровой трансформацией; оценка готовности и доступности МСП Республики Молдова к интеграции успешных информационных технологий в систему управления; разработка информационной программы SMARTAUTOSOFT – интегрированной системы управления для МСП в сфере автосервиса с целью повышения эффективности управления бизнесом; разработка плана действий по ускорению процесса цифровой трансформации МСП в Республике Молдова.

Полученные новые научные результаты: заключаются в разработке теоретических подходов относительно совершенствования системы управления МСП в условиях интеграции новых информационных технологий. В то же время была разработана информационная программа для управления МСП в сфере услуг и план действий по ускорению цифровой трансформации МСП в Республике Молдова.

Решение важной научной проблемы заключается в обосновании с научной и методологической точки зрения возможностей совершенствования системы управления МСП в условиях интеграции современных информационных технологий.

Теоретическая значимость диссертации: Проведенное исследование представляет собой ценный вклад в управленческую науку в области управления бизнесом в контексте ускорения процесса цифровой трансформации МСП.

Прикладная ценность: рассматривается через призму того, что результаты, полученные в данной работе, могут быть использованы для ускорения процесса цифровой трансформации МСП за счет учета результатов, полученных автором статьи в результате популяризации количественных исследований. В то же время, реализация плана действий, разработанного автором статьи, и информационной программы «SMARTAUTOSOFT» открывает возможность совершенствования цифровой трансформации МСП в Республике Молдова.

Внедрение научных результатов: результаты, полученные в диссертации, были внедрены в компаний О.О.О., „Slovegrena”, О.О.О., „VIP MOTORS”.

ANNOTATION

Cozniuc, Octavian. “Development of the management system of small and medium enterprises through the use of information technologies”.

Thesis of Doctor in Economic Sciences, Chisinau, 2024.

Structure of the thesis: annotation, introduction, three chapters, conclusions and recommendations, bibliography including 230 sources. The content of the paper is presented in 142 pages of main text to the bibliography, 34 tables, 68 figures, 12 annexes.

The results of the thesis have been reflected in 16 scientific papers.

Key words: management, management system, management methods, small and medium enterprises, information technologies, revolution 4.0, information technologies in business.

The purpose of the thesis: consists in the development of theoretical-methodological approaches to the improvement of the management system of small and medium-sized enterprises in the Republic of Moldova, through the prism of the integration of information technologies.

The objectives of the research: researching theoretical-methodological approaches regarding the contribution of information technologies to business development; evaluating the performance indicators of the SME sector in the Eastern Partnership, the EU and the Republic of Moldova, in the context of digital transformation; highlighting the possibilities of making the managerial system of SMEs in the field of car services more efficient; evaluation of the possibilities of integration of information technologies within the IMM in the field of automotive services; identifying the strategic directions for improving the managerial system of SMEs in the Republic of Moldova.

The scientific novelty and originality of the thesis: consists in the complex approach to the improvement of management systems specific to SMEs in the Republic of Moldova in the context of the integration of modern information technologies; identifying the most successful methods and strategies that will help SMEs in accelerating the digital transformation process; evaluating the experience of SMEs from the Eastern Partnership and the EU in aligning with the opportunities offered by digital transformation; evaluation of the readiness and availability of SMEs from the Republic of Moldova to integrate successful information technologies into the management system; development of an information program SMARTAUTOSOFT an integrated management system for SMEs in the field of car services in order to make business management more efficient; developing an action plan to accelerate the digital transformation process of SMEs in the Republic of Moldova.

New results obtained: consist in the development of theoretical approaches regarding the improvement of the management system of SMEs in the context of the integration of new information technologies. At the same time, an informational program was developed for the management of SMEs in the field of services and an action plan to accelerate the digital transformation of SMEs in the Republic of Moldova.

The solution of the important scientific problem consists in substantiating, from a scientific and methodological point of view, the possibilities of improving the SME management system in the context of the integration of modern information technologies.

Theoretical importance: the research carried out forms a valuable contribution to managerial science on the dimension of business management in the context of the acceleration of the digital transformation process of SMEs.

Applicative value: is rendered through the prism of the fact that the results obtained in this paper can be used to accelerate the process of digital transformation of SMEs by taking into account the results obtained by the author of the paper following the promotion of quantitative research. At the same time, the implementation of the action plan developed by the author of the paper and the "SMARTAUTOSOFT" informational program offers the possibility of perfecting the digital transformation of SMEs in the Republic of Moldova.

Implementation of scientific results: the results obtained during the research were implemented in LLC “Slovegrena”, LLC “VIP MOTORS”

COZNIUC OCTAVIAN

**DEVELOPMENT OF THE MANAGEMENT SYSTEM OF
SMALL AND MEDIUM ENTERPRISES THROUGH THE USE
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