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Original Article

SYNERGY OF INFORMATION SYSTEMS AND MANAGEMENT IN IMPROVING ORGANIZATIONAL COMPETITIVENESS

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Abstract: *In the modern business environment, characterized by rapid technological changes and market uncertainty, organizations face the challenge of maintaining and improving competitiveness. This paper explores the synergy between information systems and management as a key factor in strengthening organizational competitiveness, with a special focus on the integration of digital tools and managerial practices in the strategic management of business processes, innovation and data-based decision-making. The aim of this research is to assess the extent to which the application of information systems contributes to the improvement of organizational efficiency, the development of innovation capacities and the strengthening of strategic flexibility, as well as to investigate how management can optimally use digital resources to maintain and improve the competitive position. The research relies on a review of the relevant literature, analysis of case studies and an empirical study conducted among managers of medium and large enterprises, using statistical methods and regression analysis. The research results highlight the importance of integrating information systems into managerial functions and confirm that the synergy between technology and management enables more efficient decision-making, faster adaptation to market changes and the achievement of long-term competitive advantage. The work contributes to the development of the theory of business informatics and management, while the practical contribution is reflected in the guidelines that managers can immediately apply for the optimization of business processes and the digital transformation of their organizations*

Key words*: information systems; management; competitiveness of organizations; digital transformation; innovations; strategic management.*

JEL classification*: M15*

1. INTRODUCTION

The modern business environment is characterized by intensive processes of digitization, globalization and increased market uncertainty, which significantly affects the way organization function (Vial, 2019). Rapid technological changes, growing competition and the need for constant innovation impose an imperative on organizations to continuously improve their business models, processes and strategies (Satar et al., 2025). In such conditions, information systems no longer represent only technical support for business, but become a key resource for generating value, improving efficiency and making qualitystrategic decisions (Zhengzhong & Wang, 2018).

Despite the increasing importance of information systems, insufficient integration between technological solutions and managerial decision-making and planning processes is often observed

in practice. The absence of a synergistic approach between information systems and management can lead to inefficient use of digital resources, weaker organizational adaptability and limited innovation capacity. Therefore, the research problem of this paper concerns the need for a systemic understanding and improvement of the interaction of information systems and management in the function of strengthening organizational competitiveness.

The subject of the research is the analysis of the synergy between information systems and management, with a special focus on their joint impact on organizational efficiency, innovation and strategic flexibility. The aim of the work is to determine to what extent the integrated application of information systems and managerial practices contributes to the improvement of the competitive position of organizations, as well as to identify the key factors of successful digital transformation in the modern business context.

In accordance with the set goal, the work starts from the following research questions: (1) to what extent do information systems contribute to the improvement of organizational efficiency and decision-making (2) how does management use information systems for the development of innovation and strategic flexibility and (3) does the synergy between information systems and management significantly affect organizational competitiveness. Based on these questions, appropriate research hypotheses were defined, which will be empirically tested in the continuation of the work.

The methodological framework of the work includes a combination of qualitative and quantitative approaches. The theoretical part is based on the analysis of relevant contemporary literature in the field of information systems and management, while the empirical part includes survey research conducted among managers of medium and large companies. A detailed description of the sample, instruments and data collection procedure is presented in the methodological chapter. The collected data were analyzed using statistical methods — descriptive statistics and regression analysis — with the aim of testing the hypotheses and drawing valid conclusions.

The original scientific contribution of this paper is reflected in the development of an integrated model of synergy of information systems and management. The proposed model connects operational efficiency, innovation capacities and strategic flexibility in a unique framework of organizational competitiveness, which expands the existing partial approaches represented in the literature.

This study contributes to the existing literature in three key ways. First, it develops an integrated socio-technical framework that links information systems and management within a unified analytical model of competitiveness. Second, it empirically tests the mediating role of innovation capacity and strategic flexibility, which has been insufficiently explored in prior research. Third, it provides practical implications for managers by identifying concrete mechanisms through which digital transformation enhances organizational performance.

2. THEORETICAL FRAMEWORK OF RESEARCH

2.1. INFORMATION SYSTEMS IN MODERN ORGANIZATIONS

Information systems (IS) represent integrated sets of hardware, software, organizational and human resources that enable the collection, processing, storage and distribution of information in order to support business processes and decision-making (Kitsantas, 2022). In modern organizations, information systems have a strategic importance because they enable the increase of operational efficiency, the improvement of communication and the creation of additional value through better data management.

The development of information technologies has led to the emergence of different types of information systems that have specific functions in the organization. Zhengzhong & Wang (2018) believe that ERP (Enterprise Resource Planning) systems enable the integration of key business functions such as finance, production and logistics into a single information framework, while CRM (Customer Relationship Management) systems are focused on managing customer relationships and improving customer experience. BI (Business Intelligence) systems enable the analysis of large amounts of data and the generation of useful business insights, while DSS (Decision Support Systems) provide support to managers in the process of making complex decisions (Zhengzhong & Wang, 2018).

In the context of digital transformation, information systems represent a key driver of change. They enable automation of business processes, development of new business models and faster adaptation of organizations to changes in the environment. Digital transformation implies not only the application of technology, but also a change in organizational culture and way of thinking, whereby information systems play a

central role in connecting all organizational elements (Vial, 2019).

2.2. MANAGEMENT IN THE ERA OF DIGITIZATION

Management as a discipline has gone through a significant evolution — from classical theories that emphasized hierarchy and control, to modern approaches that emphasize flexibility, innovation, and knowledge management as an organization's ability to systematically create, share, and apply knowledge for business purposes. In the era of digitization, management is faced with new challenges that require faster decision-making, more efficient management of resources and developed ability to manage changes.

Digital management implies the use of digital technologies and data in all managerial functions. According to Chen & Kim (2023), data-driven decision making is becoming a key element of modern management, as it allows managers to reduce uncertainty and increase precision in planning and implementing business activities. Wan & Zhang (2025) believe that the use of analytical tools, big data and artificial intelligence additionally improves the quality of managerial decisions.

Leadership and organizational culture are of particular importance in the digital environment. Digital leaders must possess the ability to manage change, foster innovation and create an environment that supports learning and collaboration. An organizational culture that promotes openness to technology, experimentation and continuous improvement is a key factor in the successful implementation of digital solutions.

2.3. SYNERGY OF INFORMATION SYSTEMS AND MANAGEMENT

The concept of synergy between information systems and management is based on the idea that their joint action generates greater value than their individual application. Information systems provide data and analytical tools, while management uses these resources to make strategic decisions and manage the organization. Optimum efficiency and competitive advantage can only be achieved through their integration. At the same time, innovation capacities and strategic flexibility appear as key mediating mechanisms through which this synergy is translated into measurable organizational outcomes.

The integration of information systems into managerial functions is reflected in all phases of management. In the planning process, ISs enable the analysis of market trends and the prediction of future developments. In organizing, they contribute to better coordination of resources and optimization of business processes. In leadership, they provide the basis for more effective communication and transparency of information within the organization. In control, IS offer tools for performance monitoring and timely identification of deviations from planned goals.

Theoretically, Mumford (2006) believes that the synergy between technology and management can be explained through a socio-technical approach, which emphasizes the interdependence between the technical system (technology) and the social system (people and organizational structures). According to this approach, optimal results are achieved when both systems are aligned and mutually integrated, which further confirms the importance of balanced development of technology and managerial competencies.

2.4. THEORETICAL POSITIONING OF THE WORK

Based on the analyzed literature, three dominant approaches to studying the relationship between information systems and organizational competitiveness can be distinguished: technological deterministic approach, resource-oriented approach and socio-technical approach. This paper primarily relies on the socio-technical approach, but expands it by including the dimension of strategic flexibility as a key element of contemporary organizational competitiveness.

2.5. ORGANIZATIONAL COMPETITIVENESS

Organizational competitiveness represents the ability of an organization to achieve and maintain a superior market position in relation to its competitors. It can be viewed through various dimensions, including productivity, innovation, quality of products and services, as well as the ability to quickly respond to changes in the environment (Kotenko et al., 2021).

Key factors of competitive advantage include effective resource management, technological capability, innovation capacity and strategic orientation of the organization. In modern business conditions, intangible resources such as knowledge, information and organizational culture are increasingly important in relation to traditional factors of competitiveness (Hamdouna & Khmelyarchuk, 2025).

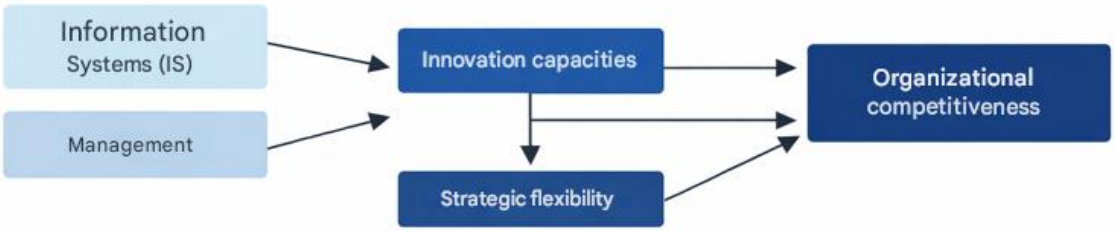
Innovation and organizational flexibility play a special role in strengthening competitiveness. Innovations enable organizations to develop new products, services and business models, while flexibility enables rapid adaptation to changes in the environment. In this context, the synergy of information systems and management is a key mechanism that enables organizations to

simultaneously improve efficiency, innovation and adaptability, thereby achieving a long-term competitive advantage

2.6. CONCEPTUAL MODEL OF RESEARCH

The proposed conceptual model shows the mutual relations between information systems and management as key independent variables, which directly and indirectly affect organizational competitiveness. Innovation capacities and strategic flexibility are viewed as mediating variables that additionally explain the mechanism through which the synergy of information systems and management contributes to the improvement of the organization's competitive position. Based on the model, research hypotheses (H1–H3) were defined, which were empirically tested within this research.

Figure 1. Conceptual model of synergy of information systems and management



Source: *Author*

3. RESEARCH METHODOLOGY

The research methodology was defined in accordance with the set goals and hypotheses of the work, with the intention of providing a reliable and valid examination of the relationship between information systems, management and organizational competitiveness.

The research design is based on a combined (mixed) approach, which integrates qualitative and quantitative methods. The qualitative part includes a systematic review of relevant scientific and professional literature in the field of information systems, management and organizational competitiveness, with the aim of theoretically establishing the research (Vial, 2019; Kitsantas, 2022).

The quantitative part was realized through survey research, which enabled empirical testing of hypotheses and statistical processing of data. N = 142 respondents from medium and large companies from the territory of Bosnia and Herzegovina participated in the research. The response rate was 71%, indicating a satisfactory response. The sample includes managers of different hierarchical levels — top, middle and operational management. It was formed using the convenient sampling method through the electronic distribution of questionnaires, with an effort to include as many organizations from different sectors as possible, so that the results would be more representative and applicable in a wider business context.

The research instrument was a structured questionnaire designed on the basis of relevant literature and previous research. It consists of four parts: (1) general data on respondents and organizations, (2) application of information systems in the organization, (3) managerial practices and decision-making, and (4) perception of organizational competitiveness. Five-point Likert scales were used to measure respondents' attitudes. The reliability of the measuring scales was tested with the Cronbach α coefficient, whereby all variables showed a satisfactory level of internal consistency ($\alpha > 0.7$). Specifically, the Cronbach α values for individual constructs were as follows: application of information systems ($\alpha = 0.81$), managerial practices ($\alpha = 0.78$), innovation capacity ($\alpha = 0.76$), strategic flexibility ($\alpha = 0.74$), and organizational competitiveness ($\alpha = 0.82$)

Data analysis was carried out in the SPSS software package. Descriptive statistics were used to show the basic characteristics of the sample and the distribution of responses (arithmetic mean, standard deviation, frequencies). Regression analysis was applied to examine the influence of independent variables — application of information systems and managerial practices — on the dependent variable (organizational competitiveness). In addition, the mediating effect of innovation capacity and strategic flexibility was tested as mediating variables in the model, which enabled comprehensive testing of the set hypotheses. It should be noted that the mediation analysis was conducted using a hierarchical regression approach; a formal bootstrapped mediation analysis (e.g., PROCESS macro) was not applied, which represents a limitation of the current study.

The research has certain limitations that should be taken into account when interpreting the results. Using a convenience sample may affect the generalizability of the findings. Data were collected through self-report by respondents, which may lead to subjective biases. In addition, the research was conducted in a certain period of time and does not include the long-term effects of the application of information systems. Despite the mentioned limitations, the research provides relevant insights and represents a good basis for future research in this area.

Table 1. Sociodemographic characteristics of the sample (N = 142)

Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	82	57.7
	Female	60	42.3
Sector	Production	46	32.4
	Services	58	40.8
	IT sector	38	26.8
Management level	Top men.	34	23.9
	Middle men.	61	43.0
	Operational men.	47	33.1

From the presented structure of the sample, one can see the dominant representation of respondents of the male gender (57.7%), with an adequate distribution by sectors and levels of management

4. RESEARCH RESULTS

This chapter presents the results of the empirical research obtained by analyzing the data collected by the survey questionnaire. The results are organized in accordance with the set research goals and hypotheses, with the application of descriptive statistics and regression analysis.

4.1. THE IMPACT OF INFORMATION SYSTEMS ON ORGANIZATIONAL EFFICIENCY

Data analysis shows that the majority of respondents recognize the significant contribution of information systems to the improvement of organizational efficiency. The average values of the responses to the statements related to process automation, reduction of operating costs and increase in productivity range from 3.8 to 4.5 on a five-point Likert scale, which indicates a high degree of agreement among respondents (Table 2).

Table 2. Descriptive statistics — respondents' views on the role of information systems (N = 142)

	Claim	M	SD
1	Information systems accelerate the execution of business processes	4.41	0.61
2	IS reduces operating costs in our organization	3.98	0.74
3	The application of IS increases the productivity of employees	4.23	0.68
4	IS enable the availability of information in real time	4.47	0.55
5	Integrated systems (ERP) improve coordination between departments	4.12	0.71
6	Digital tools encourage the generation of new ideas	3.89	0.79
7	BI tools help identify market trends	4.05	0.72
8	IS facilitate the exchange of knowledge between employees	3.94	0.76
9	The availability of accurate information speeds up decision-making	4.38	0.59
10	IS and management synergy increases strategic flexibility	4.21	0.66

Note: Values were measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). M = arithmetic mean; SD = standard deviation.

The positive influence of information systems on the speed of execution of business processes and the availability of relevant information in real time was particularly pronounced. Organizations that use integrated systems — such as ERP solutions — report higher levels of operational efficiency compared to organizations that rely on fragmented or insufficiently integrated solutions.

The above results indicate that information systems contribute to the rationalization of business operations through the automation of routine tasks, the reduction of errors and the improvement of coordination between organizational units, thus confirming their key role in the improvement of overall organizational efficiency.

4.2. THE ROLE OF IS IN THE DEVELOPMENT OF INNOVATION CAPACITIES

The research results reveal a significant connection between the application of information systems and the development of innovative capacities of organizations. Respondents largely agree that digital tools enable the generation of new ideas, the improvement of existing products and the development of new business models.

Organizations that use BI tools and data analytics more intensively show a greater ability to recognize market trends and user needs, which directly affects innovation.

In addition, information systems facilitate cooperation between employees and the exchange of knowledge, thereby additionally encouraging innovation processes within the organization.

These findings show that information systems do not act only as operational support, but as a strategic resource that enables the continuous development of the organization's innovation capacity.

4.3. SYNERGY OF IS AND MANAGEMENT IN STRATEGIC FLEXIBILITY

The synergy between information systems and management significantly contributes to increasing the strategic flexibility of organizations.

Organizations in which there is a high level of integration between digital technologies and managerial practices show a greater ability to adapt to changes in the business environment.

The respondents pointed out that the availability of timely and accurate information enables managers to make decisions faster and better.

The average scores for statements related to the speed of decision-making and the ability to react to changes exceed the value of 4.0, which speaks of the high importance of information systems in this context.

In addition to the reactive dimension, the synergy of IS and management also contributes to the development of a proactive approach to management — organizations do not just react to changes, but anticipate them.

This enables them to maintain a competitive edge in a dynamic and uncertain environment.

4.4. HYPOTHESIS TESTING

Before presenting the test results, the research hypotheses are explicitly stated below:

H1:Application of information systems has a positive effect on organizational competitiveness.

H2: Innovation capacity mediates the positive relationship between information systems and organizational competitiveness.

H3: The synergy of information systems and management has a positive effect on organizational competitiveness.

Multiple regression analysis was used to test the hypotheses, which examined the influence of independent variables on the dependent variable (organizational competitiveness).

The results are shown in Table 3.

Table 3. Results of multiple regression analysis — dependent variable: organizational competitiveness

Predictor	**β**	**SE**	**t**	**p**
Application of information systems	0.62	0.08	7.75	< 0.01
Innovation capacities (IS)	0.58	0.09	6.44	< 0.01
Synergy of IS and management	0.71	0.07	10.14	< 0.01
Model	**R^2 = 0.52**	**F = 48.3**	**df = 3/138**	**p < 0.01**

Note: β = standardized regression coefficient; SE = standard error; t = t-value; p = statistical significance

The model as a whole shows a statistically significant explanatory power ($R^2 = 0.52$; $F = 48.3$; $p < 0.01$), which means that the selected variables explain 52% of the variance of organizational competitiveness.

The results show a statistically significant and positive impact of information systems on organizational competitiveness ($\beta = 0.62$; $p < 0.01$), thus accepting hypothesis H1.

A significant positive relationship was also established between innovation capacity and organizational competitiveness ($\beta = 0.58$; $p < 0.01$), which confirms hypothesis H2.

Finally, the integration of information systems and managerial practices—operationalized as a composite synergy variable—shows a strong positive impact on organizational competitiveness ($\beta = 0.71$; $p < 0.01$), thus accepting hypothesis H3.

A summary of the results of hypothesis testing is presented in Table 4.

Table 4. Summary of hypothesis testing results

Hypothesis	β	p	Conclusion
H1	0.62	< 0.01	✓ Confirmed
H2	0.58	< 0.01	✓ Confirmed
H3	0.71	< 0.01	✓ Confirmed

Note: β = standardized regression coefficient from multiple regression analysis.

The obtained results empirically confirm all three hypotheses, which is in accordance with the theoretical assumptions about the importance of the synergy of information systems and management in improving organizational competitiveness.

5. DISCUSSION

The results of the conducted research confirm the importance of the synergy of information systems and management in improving organizational competitiveness, which is in accordance with the findings of modern literature in the field of business informatics and strategic management. Numerous studies indicate that organizations that successfully integrate digital technologies into their business processes achieve a higher level of efficiency, innovation and adaptability. The obtained results, which confirm the positive impact of information systems on organizational efficiency and innovation capacity, coincide with the conclusions of the authors who point out that digital transformation is a key factor of competitive advantage in the modern economy (Algazo et al., 2024; Chen & Kim, 2023).

In comparison with the existing literature, this research additionally emphasizes the importance of an integrative approach, i.e. synergy between technology and management, rather than viewing them as separate elements. While earlier research often analyzed the impact of information systems or management individually, the results of this work confirm that the greatest effects are achieved through their joint action, which is in line with the socio-technical approach to the organization.

Interpretation of the findings in a broader context indicates that organizations that develop digital competencies and at the same time improve managerial practices have a greater ability to respond to the challenges of the modern business environment.

In the conditions of global competition and accelerated technological changes, the ability to make quick decisions, efficiently manage resources and continuously innovate becomes crucial for long-term survival and growth. The synergy of information systems and management enables exactly this kind of organizational agility and resilience.

These results are consistent with the findings of Chen et al. (2022), who point out that digital transformation has a significant positive impact on organizational performance. Also, Tidd and Bessant (2021) emphasize that the integration of technology and management is a key factor in innovation and competitiveness.

The theoretical implications of this research are reflected in the contribution to the development of an interdisciplinary approach that connects information systems and management in a unique analytical framework. The results confirm the relevance of the socio-technical model and indicate the need for further research into the mutual interaction of technology, people and organizational processes (Satar et al., 2025). Also, the work contributes to the expansion of theoretical knowledge about the role of information systems as a strategic resource, not just an operational tool.

Unlike prior studies that predominantly examine information systems or management in isolation, this research demonstrates that their combined and mutually reinforcing effect produces significantly stronger outcomes. This finding highlights the limitation of reductionist approaches and emphasizes the necessity of an integrative perspective in analyzing organizational competitiveness in the digital era.

The practical implications of the research are particularly significant for managers and decision makers. First of all, the results indicate the need for a strategic approach to the implementation of information systems, which implies their full integration into all managerial functions. Managers should develop digital competencies and promote a data-based culture, so that they can effectively use the potential of modern technologies. It is also recommended to invest in employee training, improve organizational communication and encourage innovation through the use of digital tools.

Additionally, organizations should focus on the development of flexible organizational structures that enable quick adaptation to changes, while simultaneously using information systems for timely recognition of market trends.

The integration of technology and management should be a continuous process, not a one-off activity, in order to provide a sustainable

competitive advantage in a dynamic business environment.

CONCLUSION

The purpose of the conducted research was to examine the role and significance of the synergy of information systems and management in improving organizational competitiveness. The results of the empirical analysis clearly indicate that information systems, when adequately integrated into managerial processes, have a significant positive impact on organizational efficiency, development of innovation capacities and strategic flexibility of organizations. It is particularly emphasized that organizations that apply modern digital solutions and develop managerial competencies based on data achieve better business performance and competitive results.

In accordance with the research questions, it can be concluded that information systems significantly contribute to the improvement of business efficiency through the automation of processes and the improvement of information availability. Also, management that uses digital tools and analytical methods has a greater ability to develop innovations and adapt to changes in the environment. The most important finding of the research refers to the confirmation that the synergy between information systems and management is a key factor in strengthening organizational competitiveness, as it enables faster decision-making, better coordination of resources and more effective response to market challenges.

The results of this research clearly confirm that organizations that develop the synergy of information systems and management not only improve their performance, but actively shape their long-term competitive position in the digital economy (Wang & Zhang, 2025; Algazo et al., 2024).

The contribution of the work can be viewed from the theoretical and practical aspects. The theoretical contribution is reflected in the integration of the concepts of information systems and management into a unique analytical framework, which additionally confirms the importance of an interdisciplinary approach in the research of modern organizations. The paper also contributes to the affirmation of the socio-technical approach as a relevant theoretical model for understanding the relationship between technology and organizational processe.

The practical contribution of the paper is reflected in the identification of specific guidelines for managers and decision makers. The research results point to the need for strategic implementation of information systems, development of employees' digital competencies, and building an organizational culture that supports innovation and data-based decision-making. Organizations that successfully integrate technology and management can achieve sustainable competitive advantage and better position themselves in a dynamic and uncertain business environment.

Finally, although the research has certain limitations, it represents a relevant basis for further research in the field of digital transformation, management and organizational competitiveness, especially in the context of accelerated technological development and the increasingly pronounced need for the integration of business and information systems.

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