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Judyta Kabus✉
Jan Dlugosz University in Czestochowa

Organizational adaptability through artificial intelligence

Zdolność adaptacyjna organizacji dzięki sztucznej inteligencji

Abstract. In the face of dynamic market changes, growing uncertainty, and increasing digitization, the adaptability of organizations is becoming a key factor in their survival and growth. Artificial intelligence (AI) is increasingly acting as a tool to support the operational flexibility and crisis resilience of businesses. The purpose of this study was to identify how AI affects the adaptability of companies and what benefits and challenges are associated with its implementation. The study is based on an analysis of quantitative data obtained from a survey of company representatives from various industries and positions. The respondents assessed the degree of implementation of AI solutions, the scope of business processes supported, and the barriers encountered. The results indicate that AI most often supports decision-making, operations automation, and data analytics, which directly translates into increased adaptability for organizations. The main benefits are streamlined processes, greater efficiency, and the ability to respond quickly to changes in the environment. AI can significantly enhance an organization's adaptability, provided it is properly implemented and strategically aligned with business goals.

Keywords: intelligent systems, flexibility of enterprises, digital transformation, innovation

Synopsis. W obliczu dynamicznych zmian rynkowych, rosnącej niepewności oraz postępującej cyfryzacji zdolność adaptacyjna organizacji staje się kluczowym czynnikiem ich przetrwania i rozwoju. Sztuczna inteligencja (AI) coraz częściej pełni funkcję narzędzia wspierającego elastyczność operacyjną i odporność kryzysową przedsiębiorstw. Celem niniejszego badania było zidentyfikowanie, w jaki sposób AI wpływa na adaptacyjność firm oraz jakie korzyści i wyzwania wiążą się z jej wdrażaniem. Badanie opiera się na analizie danych ilościowych uzyskanych na podstawie ankiety przeprowadzonej wśród przedstawicieli firm z różnych branż i na różnych stanowiskach. Respondenci oceniali stopień wdrożenia rozwiązań AI, zakres wspieranych procesów biznesowych oraz napotykane bariery. Wyniki wskazują, że AI najczęściej wspiera procesy decyzyjne, automatyzację operacji i analitykę danych, co bezpośrednio przekłada się na zwiększenie zdolności adaptacyjnej organizacji. Główne korzyści to: usprawnienie procesów, większa efektywność

✉**Judyta Kabus** – Jan Dlugosz University in Czestochowa; j.kabus@ujd.edu.pl; https://orcid.org/0000-0002-7119-3327

oraz możliwość szybkiego reagowania na zmiany otoczenia. Sztuczna inteligencja może istotnie wzmacniać zdolność adaptacyjną organizacji pod warunkiem jej właściwego wdrożenia i strategicznego dopasowania do celów biznesowych.

Słowa kluczowe: sztuczna inteligencja, zdolność adaptacyjna organizacji, transformacja cyfrowa, innowacje

JEL codes: M15, O31

Introduction

Dynamic technological changes, increasing unpredictability of the market environment, and intensive digitization of business processes are driving organizations to seek new tools to increase their resilience and flexibility of operations [Gasz 2024]. One of the most promising directions for supporting an organization's adaptability is the use of artificial intelligence (AI) [Gocko 2025], which, through advanced data analysis algorithms, enables faster decision-making, automation of repetitive processes, and accurate prediction of market changes [Jabłoński & Jabłoński 2023, Chen et al. 2023].

Previous research indicates that AI is applied in many areas of business operations – from human resource management and financial analysis to customer service and marketing strategy [Patra et al. 2024, Bielińska-Dusza 2022]. The literature also increasingly emphasizes the impact of AI on strategic processes [Janik et al. 2023, Huber & Alexy 2024] and the ability of organizations to transform under conditions of market volatility and disruption [Rajagopal et al. 2022, Kotte 2025].

Despite the growing number of publications in this area, there is still a research gap regarding a comprehensive assessment of both the benefits and barriers surrounding the implementation of AI in the practice of organizations. In particular, there is a lack of analysis that takes into account industry diversity and the actual experiences of respondents from different levels of management.

The purpose of this article is to examine the impact of implementing AI-based solutions on an organization's adaptability, with a focus on perceived benefits, areas of application, and difficulties accompanying implementation. The paper contributes to the existing state of knowledge by providing results based on a representative sample of respondents from various economic sectors.

Materials and methods

The article uses a quantitative research method, based on analysis of data from a survey of 192 respondents representing various industries and positions. The survey was conducted from 1 March to 30 April 2025, using the Computer-Assisted Web Interviewing (CAWI) method. A link to the questionnaire was emailed to 250 randomly selected companies (in industry proportions consistent with the data from the Central Statistical Office of Poland) and shared in closed industry groups on LinkedIn. A total of 192 completed surveys were received, corresponding to a return rate of 76.8%. The study was exploratory in nature; therefore, an equal number of respondents from individual occupa-

tional groups was not assumed. The structure of the sample presented in the charts reflects the actual responses obtained in the survey rather than the proportions of invitations sent. The aim was to capture the real opinions and experiences of those who chose to participate in the study, particularly those directly involved in the processes of AI implementation.

With this sample size and the assumption of a large ($N > 10{,}000$) population of companies actively using digital technologies in Poland, the maximum estimation error is 7 p.p. at a confidence level of 95%, so the results can be considered representative of the analyzed segment.

The questionnaire consisted only of closed questions (single- or multiple-choice and five-point Likert scales), which made it possible to directly codify responses and use chi-square tests of concordance. Before the actual survey, a short pilot study was conducted on 10 respondents, which served to clarify the instructions and eliminate unclear wording.

The purpose of the paper was to identify the impact of implementing AI-based solutions on an organization's adaptability and to identify the key benefits and difficulties associated with their implementation.

Two research hypotheses were posed:

H1: The implementation of AI in organizations is associated with a significant increase in perceived operational benefits.

H2: High implementation costs and difficulties in integrating with existing systems are the most important barriers to the implementation of AI in organizations.

To verify the hypotheses and response distributions, chi-square tests of concordance were used to assess the statistical significance of deviations from random distributions. The tests were conducted for such variables as: position, industry, implementation of AI in the organization, benefits and difficulties of implementing AI, and business processes supported by the technology. In addition, tests for the significance of differences in proportions (z-score) were used in order to indicate which responses were significantly different from expectations.

The research results were presented in the form of tables and graphs, which enabled the clear presentation of statistically significant trends. The analytical methods used allowed for the identification of areas where AI contributes to an organization's adaptability (e.g., automation, cost optimization, service personalization) as well as the ones that pose the greatest challenges (e.g., systems integration, lack of competence, implementation costs).

The entire analysis was based on an empirical approach, enriched by the interpretation of quantitative data in an organizational and technological context. As a result, the study provides both specific statistical conclusions and practical implications for companies considering implementing AI as a tool to support their adaptation capacity.

Research results and discussion

In the first step of the analysis, the consistency of the distributions of responses to the question about the position held was verified. For this purpose, a chi-square test of concordance was performed. The results obtained indicated that the distribution of positions in the study group differed significantly from the random distribution ($\chi^2(5)$

= 16.56; p = 0.005). It turned out that among the respondents, there were significantly more IT specialists (Z = 2.65; p = 0.008) and significantly fewer data specialists (Z = –2.83; p = 0.005). No statistically significant differences in numbers were observed for other positions. The analysis results are illustrated in Figure 1.

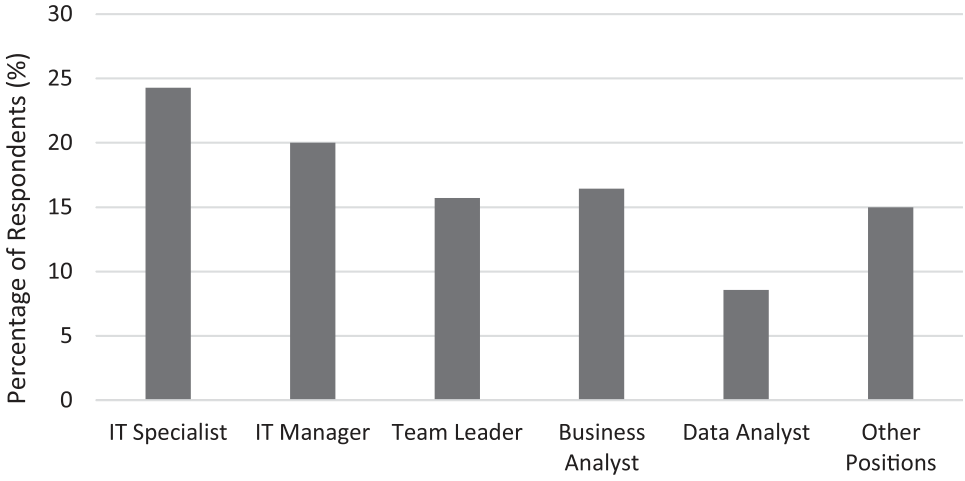

Figure 1. Structure of positions of the respondents participating in the survey (N = 192)
Rysunek 1. Struktura stanowisk respondentów biorących udział w badaniu (N = 192)

Source: own research
Źródło: badania własne

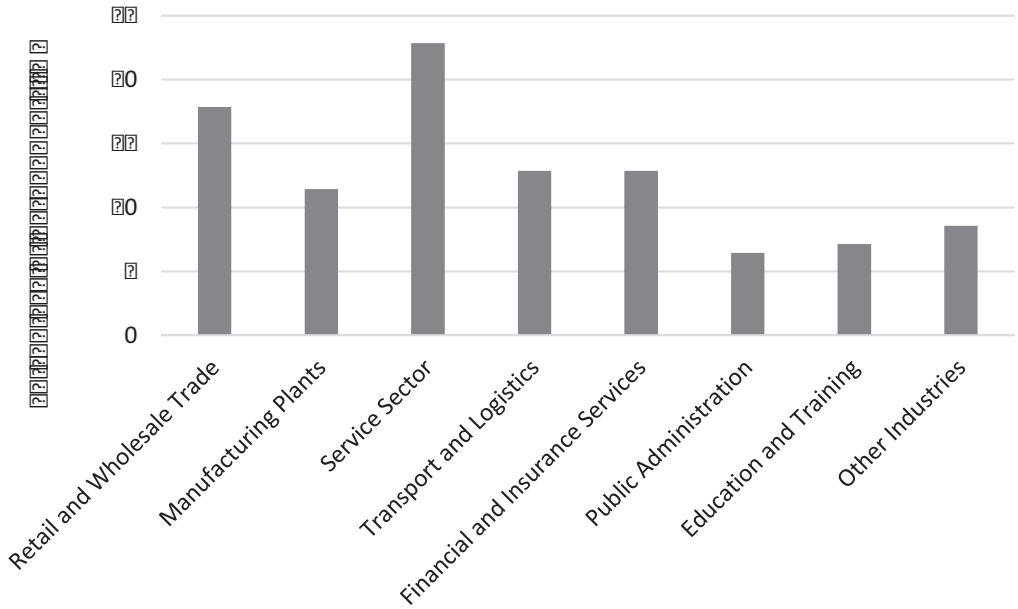

Figure 2. Distribution of respondents by industry (N = 192)
Rysunek 2. Klasyfikacja respondentów według sektorów działalności (N = 192)

Source: own research
Źródło: badania własne

Next, the concordance of the distributions of responses to the question about the industry was analyzed. For this purpose, a chi-square test of concordance was performed. The results indicated that the distribution of industries in the study group differed significantly from the random distribution ($\chi^2(7) = 34.00$; $p < 0.001$). It was also determined that there were significantly more service industry ($Z = 4.08$; $p < 0.001$) and trade ($Z = 2.04$; $p = 0.041$) employees among the respondents, and significantly fewer employees of the public sector ($Z = -2.45$; $p = 0.014$) and of the education and training sector ($Z = -2.04$; $p = 0.041$). No statistically significant differences in numbers were observed for other industries (Fig. 2).

In the next step of the analysis, the concordance of the distribution of responses to the question about the implementation of AI-based solutions in the organization was verified. For this purpose, a chi-square test of concordance was performed. The results indicated that the distribution of responses in the study group differed significantly from the random distribution ($\chi^2(1) = 70.08$; $p < 0.001$). Among respondents, there were significantly more people indicating that AI-based solutions should be implemented in their organizations (Fig. 3).

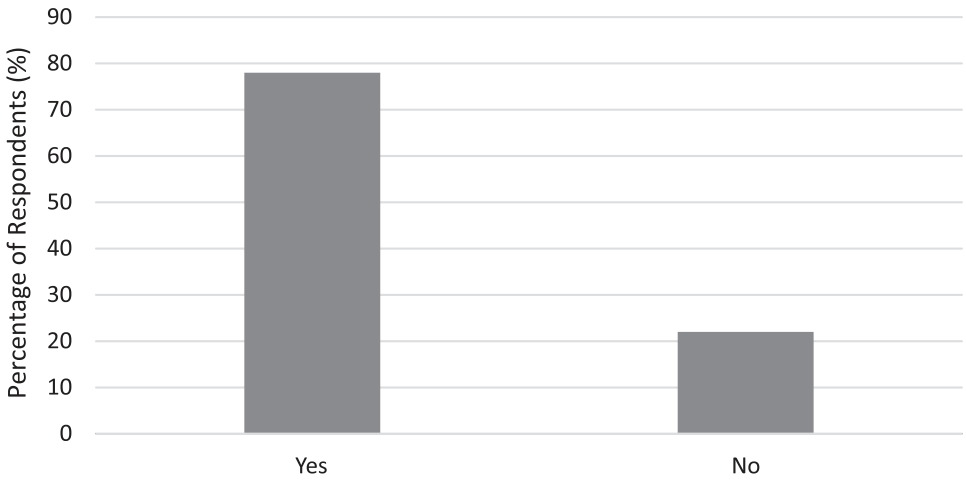

Figure 3. Validity of implementing artificial intelligence in organizations ($N = 192$)
Rysunek 3. Korzyści płynące z wdrażania sztucznej inteligencji w firmach ($N = 192$)
Source: own research
Źródło: badania własne

The consistency of the distributions of responses to the question about the benefits of implementing AI was then verified. For this purpose, a chi-square test of concordance was performed. The results of the analysis are shown in Table 1.

The respondents were significantly more likely to point to benefits such as reduced process execution time, reduced human error, optimized operating costs, and automation of repetitive tasks, and significantly less likely to point to such benefits as increased precision of market forecasts, improved human resource management, increased organizational flexibility, better strategic decision-making, and increased competitiveness. It was further noted that improvements in customer service were indicated with a frequency close to random.

Table 1. Results of the chi-square test of concordance for responses to the question about the benefits of implementing artificial intelligence (N = 192)

Tabela 1. Wyniki analizy testu chi-kwadrat dla pytania dotyczącego korzyści z zastosowania sztucznej inteligencji (N = 192)

Benefits of implementing artificial intelligence	Yes		No		$\chi^2(1)$	p
	N	%	N	%		
Accelerating the execution of business operations	151	78.57%	41	21.43%	63.02	**<0.001**
Reducing human errors	137	71.43%	55	28.57%	35.02	**<0.001**
Reducing operating costs	142	74.11%	50	25.89%	44.08	**<0.001**
Improving standards and efficiency in dealing with customers	86	44.64%	106	55.36%	2.08	0.149
Improving the accuracy of market forecasts	53	27.68%	139	72.32%	38.52	**<0.001**
Replacing routine tasks with automated systems	122	63.39%	70	36.61%	14.08	**<0.001**
Streamlining employee recruitment, evaluation, and development processes	41	21.43%	151	78.57%	63.02	**<0.001**
Providing greater ability to adapt to change	51	26.79%	141	73.21%	42.19	**<0.001**
Supporting in making management decisions	50	25.89%	142	74.11%	44.08	**<0.001**
Strengthening the company's position in the market	33	16.96%	159	83.04%	82.69	**<0.001**
No noticeable effects	3	1.79%	189	98.21%	180.19	**<0.001**

Source: own research

Źródło: badania własne

The next step in the analysis was to verify the concordance of distributions of responses to the question about business processes supported by AI. For this purpose, a chi-square test of concordance was performed. The results of the analysis are shown in Table 2.

The results confirmed that respondents were significantly more likely to indicate processes such as office process automation and personalization of customer service, and significantly less likely to indicate processes such as analysis and prediction of market trends, customer relationship management, recruitment and data analysis in the area of HR management, financial analysis, development of marketing strategies, monitoring and optimization of production processes, supporting innovation and new product development, and others. It also showed that optimization of logistics and supply chain management was indicated with a frequency close to random.

The final stage of the study was to determine the concordance of the distributions of responses to the question about the difficulties encountered in implementing AI. For this purpose, a chi-square test of concordance was performed. The results of the analysis are shown in Table 3.

Table 2. Results of the chi-square test of concordance for responses to the question about business processes supported by artificial intelligence ($N = 192$)

Tabela 2. Wyniki analizy testu chi-kwadrat dla odpowiedzi na pytanie o procesy biznesowe wspierane przez sztuczną inteligencję ($N = 192$)

Applications of artificial intelligence in enterprises	Yes		No		$\chi^2(1)$	p
	N	%	N	%		
Streamlining office tasks	135	70.54%	57	29.46%	31.69	**<0.001**
Effective transportation and delivery planning	87	45.54%	105	54.46%	1.69	0.194
Customization of services to meet individual customer needs	129	66.96%	63	33.04%	22.69	**<0.001**
Forecasting market changes and behaviors	79	41.07%	113	58.93%	6.02	**0.014**
Customer relationship management	41	21.43%	151	78.57%	63.02	**<0.001**
Support in the selection and evaluation of employees	57	29.46%	135	70.54%	31.69	**<0.001**
Evaluation of financial performance and risks	55	28.57%	137	71.43%	35.02	**<0.001**
Designing of campaigns and promotional activities	72	37.50%	120	62.50%	12.00	**<0.001**
Overseeing production efficiency and quality	77	40.18%	115	59.82%	7.52	**0.006**
Stimulating the creation of innovative solutions	45	23.21%	147	76.79%	54.19	**<0.001**
Others	3	1.79%	189	98.21%	178.26	**<0.001**

Source: own research

Źródło: badania własne

Table 3. Results of the chi-square test of concordance for responses to the question about difficulties encountered during the implementation of artificial intelligence ($N = 192$)

Tabela 3. Wyniki analizy testu chi-kwadrat dla odpowiedzi na pytanie o trudności napotkane podczas wdrażania sztucznej inteligencji ($N = 192$)

Challenges of implementing artificial intelligence	Yes		No		$\chi^2(1)$	p
	N	%	N	%		
High implementation costs	118	61.61%	74	38.39%	10.08	0.001
Lack of competence in the team	91	47.32%	101	52.68%	0.52	0.470
Difficulty integrating with existing systems	111	58.04%	81	41.96%	4.69	**0.030**
Limited acceptance among employees	63	33.04%	129	66.96%	22.69	**<0.001**
Insufficient data to train AI models	106	55.36%	86	44.64%	2.08	0.149
Problems with adapting AI to industry specifications	48	25.00%	144	75.00%	48.00	**<0.001**

Source: own research

Źródło: badania własne

The analysis showed that respondents were significantly more likely to point to difficulties such as high implementation costs and difficulties integrating with existing systems, and significantly less likely to point to difficulties such as limited acceptance among employees and problems adapting the AI to industry specifications. It proved that lack of competence in the team and insufficient data to train AI models were indicated with a frequency close to random. The results of the analysis are illustrated in Figure 4.

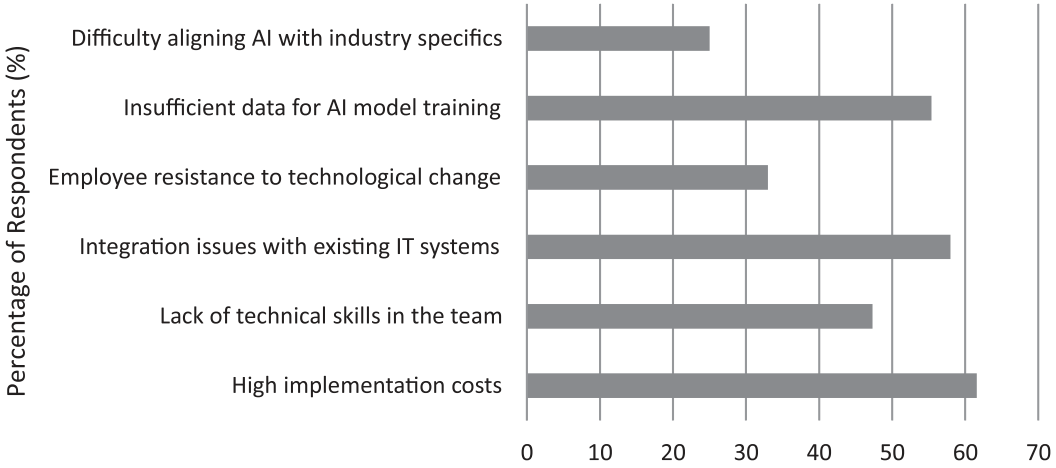

Figure 4. Barriers encountered in implementing artificial intelligence ($N = 192$)
Rysunek 4. Bariery przy wdrażaniu sztucznej inteligencji ($N = 192$)

Source: own research
Źródło: badania własne

The results of the survey provide important information on how AI is perceived and implemented in various sectors of the economy. Statistical analysis showed that the structure of respondents' positions and industries was not a coincidence – IT professionals and representatives of the service and trade industries dominated, which may indicate that these environments are more open to technological innovation.

The vast majority of respondents (78%) indicated that AI-based solutions have been implemented in their organizations. This indicates the growing adoption of this technology in business practice [Dinu 2024]. Moreover, the results clearly show that the implementation of AI is associated with a number of specific operational benefits – in particular, speeding up process execution, reducing human errors, and lowering operational costs [Subhani 2024, Panek 2024]. These findings are consistent with previous research in the literature, which indicates that AI acts as a catalyst for organizational productivity and efficiency.

At the same time, data shows that not all of the expected benefits of AI are widely recognized [Rahman et al. 2024]. Only a small percentage of respondents noted improvements in areas such as strategic decision-making, increased competitiveness, or organizational flexibility. This may indicate that AI implementations often focus on operational rather than strategic aspects of the business. Another possible explanation is the immaturity of implementations – organizations may still be in the early stages of adaptation, which limits the full potential of AI.

The results on AI-supported business processes are also interesting. Automation of administrative tasks and personalization of customer service were by far the ones cited most frequently. Less common were applications in financial analysis, creating marketing strategies, or supporting innovation. This may suggest that companies are primarily focused on implementing solutions with a quick and measurable return on investment, avoiding more complex and long-term transformation projects.

In turn, the analysis of barriers to AI implementation confirmed the significant challenges faced by organizations. The most common reasons cited were the high cost of implementation and the difficulty of integrating with existing IT infrastructure. Although the literature also often emphasizes the importance of team competence or acceptance of change among employees [Myszak et al. 2025], the results of the study suggest that these factors are not perceived as critical to the same extent. This may be due to the fact that respondents mainly represented sectors with higher levels of digitization, where cultural and competence barriers are lower.

In conclusion, the analysis of the results indicates that AI is an important tool to support the development of organizations, especially in operational areas. At the same time, it reveals the need for a systemic approach to its implementation – taking into account both technological and organizational aspects. In the future, it is worth conducting further comparative studies to assess the differences between industries and the maturity stages of AI implementations, depending on the size and type of organization.

Conclusions

The results of the survey clearly confirm that AI plays an important role in strengthening the adaptability of organizations, especially in operational and analytical areas. Identified benefits, such as process automation, reduction of human error, and cost optimization, indicate that AI can realistically increase the efficiency of companies' operations and their ability to respond quickly to changes in the environment. At the same time, data analysis reveals that the strategic capabilities of AI – such as supporting management decisions, enhancing competitiveness or organizational flexibility – are still being used to a limited extent. This may indicate that organizations are at an early stage of digital maturity, or they lack the resources to make full use of the potential of this technology.

Although the survey was based on a representative sample of 192 respondents from various industries, some limitations should be noted. First of all, representatives of the service industry and IT departments dominated among the respondents, which may have influenced the perception of both the benefits of and barriers to AI implementation. In addition, the cross-sectional nature of the study does not allow for the analysis of the long-term effects of implementing this technology.

Despite these limitations, the study makes an important contribution to the literature by providing empirical evidence of the relationship between AI implementation and increased operational flexibility of organizations. It also indicates that the key barriers to AI implementation remain the high cost of implementation and the difficulty of integrating new solutions with existing IT systems. These results are important both in theoretical terms – confirming the assumptions of dynamic capability theory – and in practical

terms, providing guidance to managers on where to place resources and what risks to take into account in the implementation process.

The data collected can also be useful for public institutions and policymakers who design programs to support the digital transformation of businesses. Knowledge of actual implementation barriers and areas with the greatest potential for adaptation can be used to shape effective strategies to support the development of innovation and the competitiveness of companies.

It is recommended that further research focus on observing the long-term impact of AI on the development of organizations. It is also worth conducting an in-depth analysis of cross-industry differences and analyzing the impact of the size of an organization and its level of digital sophistication on the effectiveness of using AI.

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