

Львівський державний університет фізичної культури імені Івана Боберського



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ІННОВАЦІЇ, ГОСТИННІСТЬ, ТУРИЗМ: НАУКА, ОСВІТА, ПРАКТИКА

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У тезах доповідей IV Всеукраїнської науково-практичної конференції молодих учених висвітлено результати досліджень пріоритетів і перспектив розвитку підприємств готельно-ресторанного бізнесу; сучасні тенденції та регіональні пріоритети розвитку туризму в умовах глобалізації; соціально-економічні засади менеджменту та маркетингу індустрії гостинності; актуальні проблеми модернізації готельно-ресторанного господарства.

Матеріали будуть корисними для студентів, викладачів, науковців і працівників індустрії гостинності.

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THE EFFECTIVENESS OF IMPLEMENTING ARTIFICIAL INTELLIGENCE TOOLS IN POLISH ENTERPRISES

Abstract. The purpose of this article is to conduct a thorough assessment of the impact of artificial intelligence (AI) on Polish enterprises, with a particular focus on identifying challenges and recommended development directions. In the context of the era of digitalization and globalization, enterprises are facing the need to adapt to increasingly complex operational processes and dynamically evolving customer preferences and competitive environment. These changing business conditions justify the indispensability of conducting research on the impact of artificial intelligence (AI) on Polish enterprises. The article describes the adaptation of AI in various sectors and enterprises and identifies how these technologies affect the operation of companies in the current economic reality, making an important contribution to understanding the role of artificial intelligence in the context of Polish business.

Introduction. With the rapid advancement of technology, artificial intelligence (AI) tools are becoming an increasingly common and important part of business strategies in enterprises around the world. Their implementation is aimed at increasing operational efficiency, optimizing business processes and improving the competitiveness of organizations. In the era of and globalization, companies have to deal with increasingly elaborate and complex operational processes. Rapid changes in customer preferences, the emergence of new technologies and increasing competition

are forcing companies to be able to adapt and respond to current challenges. The constant need to improve processes, adjust marketing strategies and monitor market trends requires tools that can quickly analyze data and make accurate decisions. In response to these challenges, artificial intelligence is emerging as a key tool that supports businesses in running their operations efficiently. Its ability to analyze data in real time, predict trends, personalize offerings or automate processes is an important contribution to improving operational performance and increasing competitiveness.

Today's business world faces unique challenges that arise from increasingly complex business processes and a rapidly changing market environment, leading to implementation. Implementation means the enactment, execution or implementation of specific activities, plans or solutions in practice. In the context of artificial intelligence in businesses, implementation refers to the introduction and use of technologies related to artificial intelligence in an organization's daily operations, business processes and strategies. It is the process of adapting and implementing artificial intelligence-based solutions to a company's specific operations in order to improve efficiency, innovation and achieve business goals. Businesses are looking for innovative solutions to effectively compete and adapt to dynamic conditions. In this context, the use of artificial intelligence (AI) as a tool to optimize processes and support decision-making is assimilating more and more importance. The field of artificial intelligence is the subject of many scientific studies. A review of this body of work makes it possible to conclude that the research discourse most often tries to point to the use of artificial intelligence in medicine (Kulwikowski 2019; Patrzyk, Wozniacka, 2022; Shorten, Khoshgoftaar and Furht, 2021), in economics (Batorski 2015; Błachowicz 2019, Rojszczak 2020), or computer science (Floridi, Chiriatti, 2020; Gray 2020; Southgate et al, 2018). In contrast, relatively few scientific studies are devoted to analyzing the use of AI technologies in enterprises in Poland. The research gap identified in this regard provided the rationale for this article. The presented results of the study and their implications for the future of business will be discussed in the context of the growing role of artificial intelligence. The goal is to look at the degree of AI adoption in different sectors and sizes of businesses, and to understand how these technologies affect their operation in the current economic environment.

Research methodology. The multifaceted nature of the use of artificial intelligence in the business process poses unique challenges for its quantitative evaluation. The initial step in the research conducted was to analyze the formation of various indicators, calculated on the basis of data contained in CSO databases. In the research process, various aspects of the observed changes were taken into account, and by way of compromise, due to the limited informational capabilities of the aforementioned databases, for the purposes of this study a set of variables was selected that influenced the development of individual provinces, while shaping their dynamics.

Survey results. The survey provides important information on the degree of adoption and use of artificial intelligence among enterprises in Poland. It shows that 2.9% of the surveyed enterprises declared the use of AI technology. Analyzing the data by enterprise size and industry, we note a variation in the degree of adoption of this technology. The highest share of those using AI tools was recorded among large enterprises (17.5%) and in the information and communication sector (16.3%), while the lowest values were among small enterprises (1.9%) and in the construction sector (0.3%). The analysis of the progress shows varying levels of use of artificial intelligence technology by enterprises in Poland in 2021. Large enterprises and industries related to information, communication and professional and scientific activities showed a higher percentage of AI use. On the other hand, smaller enterprises and some industries, such as construction and real estate services, continued to be lower in their adoption of AI technologies. This suggests the potential for further growth in the use of AI in the future, especially in smaller companies and certain industries.

The 2021 survey provided important insights into the dominant areas of application of Artificial Intelligence (AI) technologies in companies. Analyzing the results of this survey, we can see that technologies aimed at automating processes occupy a leading position, shaping 1.4% of a representative sample of surveyed companies. Recalling the paradigm of saving time and resources, they correlate par excellence, as it were, with the drive to maximize the operational efficiency of companies. In the context of further accentuated areas, technologies that analyze written language and those based on machine learning mechanisms gain significant emphasis in the structure of AI usage, accounting for 0.8% and 0.7% of the surveyed businesses, respectively. This highlights the growing trend toward using AI to accurately analyze and process large textual data sets, and the push toward

predictive modeling. Similarly, relative technologies for image processing, speech identification, and automated machine control are seeing increasing penetration at around 0.7% of companies. These observations testify to their concrete application in areas such as pattern extraction in images, voice interaction and automatic control, thus shaping the specificity of AI in companies. Of undiminished importance is the growing importance of natural language generation, which was present in the practices of 0.3% of the companies surveyed. Despite its relatively smaller share, this technology has profound potential, capable of metamorphosis in the process of content creation and constructive interaction with clientele.

Analyzing the results of the territorial survey, we note a significant variation in the use of IS technology between the different provinces of Poland. The Mazowieckie Voivodeship shows the highest percentage of IS technology use, reaching 5.4%. This result may be due to the concentration of large business centers, research institutions and innovative clusters in this region. However, other provinces also show a significant degree of AI technology use, such as Kujawsko-Pomorskie, Lubuskie, Pomorskie and Śląskie, reaching 3.3%. It is worth noting the provinces that show lower rates of AI technology use. For example, the provinces of Podkarpackie, Podlaskie, Warmińsko-Mazurskie and Zachodniopomorskie reach levels of 1% or marginally higher. These results may reflect differences in technological development, access to capital resources and AI integration initiatives in the business sector.

The introduction of Artificial Intelligence (AI) technologies into various areas of business is an important factor in business efficiency and innovation. Analyzing this structure of AI technology usage goals can provide insight into the dynamics of AI adaptation and reveal the areas where these technologies are having the greatest impact. The results of the analysis show that enterprises in 2021 were most likely to use AI technologies in the context of processes related to marketing or sales, reaching 1.1%. This may indicate active use of AI for market analysis, creating personalized offers and optimizing marketing strategies. Another area relevant to the use of AI is work organization and office work, accounting for 0.8% of the companies surveyed. In this context, AI can be used to automate routine tasks, optimize office processes and analyze employee performance. The production process and ICT security also show a significant share, shaping 0.8% each of the surveyed enterprises.

Automating manufacturing processes using AI can help improve the efficiency, quality and flexibility of production. Meanwhile, the use of AI in the context of ICT security can help detect and counter cyber threats. In addition, business management and logistics reach shares of 0.6% and 0.4%, respectively. This may suggest a growing interest in using AI for strategic decision-making and supply chain optimization. An analysis of the goals for the use of AI technologies in businesses in 2021 highlights their versatile potential in various areas of business.

While the implementation of Artificial Intelligence (AI) technology poses significant challenges for businesses, it is also undoubtedly associated with potential benefits and innovative opportunities. This analysis aims to explore the causes and uncover the barriers limiting AI adoption. The results presented here reflect the complex nature of the obstacles inhibiting the implementation of AI technologies. Excessive implementation costs are a key factor, identified by 1.4% of companies as a barrier. This is understandable given the initial investment capital that may be required for successful IS implementation and adaptation. Lack of sufficient human resources and knowledge is another significant factor with an identified share of 1.1%. Adequate staff training and the acquisition of the necessary IS competencies appear to be key in overcoming this barrier. Technology incompatibility, related to incompatibility, is a challenge for 0.9% of enterprises. This may involve the need to adapt existing technology infrastructure to meet AI requirements. There are also regulatory aspects, where 0.7% of companies cited lack of clarity on legal issues as an inhibiting factor. Privacy issues and potential privacy breaches are also significant concerns for the same group of companies, which was also reported by 0.7% of companies. Additionally, difficulties in accessing data and assessing the unusability of artificial intelligence affect 0.7% and 0.5% of companies, respectively. Ethical values, although reported at the lowest level (0.3%), also play a role in the context of AI considerations.

An analysis of the reasons for the underutilization of Artificial Intelligence (AI) technology in enterprises in 2021 reveals that there are a number of complex factors contributing to the resistance or delay in AI adoption. Obstacles such as implementation costs, lack of competence, technology incompatibility and regulatory issues require a holistic approach in transforming organizations to harness the potential of AI. Solving these

challenges can contribute to more efficient and innovative business operations in the modern business environment.

In 2030, the European Union has set an ambitious goal of becoming a world leader in digital technologies, including the use of artificial intelligence (AI) by at least 75% of businesses. At the same time, this can be finalized with 80% digital literacy among European citizens. In response to these challenges, Amazon Web Services (AWS) has launched a study to understand the potential of cloud computing and artificial intelligence in meeting Europe's digital ambitions. The survey was conducted by independent consulting firm Strand Partners, based on Public First's 2022 report. The sample included 1,000 companies and 1,000 citizens in Poland. It analyzed the pace of adoption of advanced digital technologies, particularly artificial intelligence, and identified barriers and challenges facing Poland in achieving the goals of the Digital Decade. The year 2023 was identified as the "year of artificial intelligence" in Poland and Europe, with an increase of 22% for companies in Poland and 32% in Europe adopting artificial intelligence compared to 2022. Projections indicate that maintaining this rate of adoption until 2030 could add 576 billion PLN to the Polish economy. The survey found that companies already using artificial intelligence saw an increase in revenue (94%) and a boost in innovation (88%). However, a lack of digital skills remains a major challenge, with 48% of companies indicating deficiencies in basic digital skills. The survey results suggest that Poland is moving toward achieving the goals of the Digital Decade, but there is a need to overcome the barrier of digital skills gaps. Investment in digital training for employees and citizens is key to further accelerating the adoption of artificial intelligence and achieving its full transformational potential.

Summary and directions for future research. The article presents the effectiveness of implementing artificial intelligence tools in Polish companies. The conclusions of the research are presented below:

1. The analysis of the results of the conducted research in 2021 indicates that the implementation of artificial intelligence in Polish enterprises is gradual and varied.

2. The 2021 survey indicates that industries with high dynamism and innovative character, such as information and communication, show greater readiness to adopt and adapt AI tools. Despite the potential of AI technology,

many enterprises are still not using it, mainly due to the high cost of implementation and lack of knowledge about the technology.

3. Analyzing the results of the 2021 Territorial Survey noted a significant diversification in the use of artificial intelligence (AI) technologies between the different provinces of Poland. This phenomenon is a negative effect and can lead to inequalities in social and economic development. In order to bridge these gaps and promote even adoption of AI in all regions of the country, educational and investment activities are needed, both at the local and national levels.

4. Poland has seen a significant increase in AI adoption in 2023, which could contribute to additional economic growth and innovation. However, the digital skills gap is a significant challenge that needs to be effectively overcome for Poland to meet its digital goals for the next decade.

5. Bringing innovation based on artificial intelligence will be a key element of competitive strategy in an increasingly dynamic business environment.

Research on artificial intelligence in Poland is a key element in the context of achieving digital goals and further developing the country in the technological age. By continuing research in the aforementioned areas, we can better understand the potential of artificial intelligence and its challenges, which will enable more effective use of this technology in various sectors of the economy and in everyday life. Supporting research and taking action at the political and institutional levels are key to creating an enabling environment that will allow Poland to take full advantage of the opportunities presented by artificial intelligence. Poland has the potential to play an important role as an innovative leader in digital technologies.

Keywords: artificial intelligence, development, implementation, technological progress.

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