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THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE DEVELOPMENT OF THE COMPANY'S BUSINESS PROCESSES

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Abstract. *Doing business in the conditions of globalization and rapid changes requires from entrepreneurs constant development and adaptation, search for new ideas and use of advanced technologies. Active competition and functioning in conditions of uncertainty require the formation of new competitive advantages, effective management of business processes and digital awareness. The aim of the paper is the systematization of the key approaches to implementation of artificial intelligence in business processes of the company and assessment of its influence on business results Empirical research uses quantitative methodology. Secondary data is collected from surveys and reports of leading world consulting companies. Within the framework of the research, the essence and key directions of artificial intelligence development were studied. Analysis of the use of artificial intelligence in company's business processes was conducted. The positive cases of artificial intelligence implementation were considered, the influence of AI solutions on the development of modern organizations was determined. Advantages and disadvantages of AI solutions for business were considered.*

Key words: *AI, artificial intelligence, business, business process, development*

JEL Classification: M21; O30; P13; C80

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1. INTRODUCTION

Doing business in the conditions of globalization and rapid changes requires from entrepreneurs constant development and adaptation, search for new ideas and use of advanced technologies. In particular, digital technologies and artificial intelligence (AI) are increasingly being used in past decades. Business researchers and practitioners need to understand that AI is a new business reality which constantly changes. Video games, self-driving cars, chatbots, facial recognition technologies, voice assistants, and even social media advertising are powered by AI.

Active competition and functioning in conditions of uncertainty require the formation of new competitive advantages, effective management of business processes and digital awareness. According to the IBM Global AI Adoption Index 2022 (IBM, 2022), 35% of companies use artificial intelligence in business, and another 42% are exploring the possibilities of its application. That is, technological solutions based on AI are no longer entertainment for young people, but a full-fledged tool of influence and profit. Already today, AI instruments know how to write texts and music, create pictures, analyze legal cases, perform complex medical surgeries and control complex devices.

Despite the lack of experience and possible risks of use (inaccuracy of data, misinformation, etc.), the use of AI in both business and everyday human life is constantly expanding. According to the American consulting company Gartner, in 2018 the global value of business related to artificial intelligence was estimated at $1.2 trillion. In 2022, this figure increased to $3.9 trillion. It is expected that by 2030, the contribution of artificial intelligence to the world economy will reach $15.7 trillion (Gartner, 2023).

It is worth understanding that AI is not just an application but also the difficult computer system capable of independently solving tasks for which the human mind is usually used. It appeared in 1956, but gained enormous popularity only in recent years. This is facilitated by the significant improvement of machine learning technologies and algorithms.

Such a tool is of great importance for the development of business and entrepreneurship, the transition to the economy of new generations and the creation of new added value. Artificial intelligence is used to automate processes and improve the efficiency of business operations. According to Forbes (Forbes, 2021), the application of AI in business can speed up production processes by 50%, reduce costs by 20% and improve product quality by 60%. AI owes its development to the increase in the amount of data. Research data confirmed that between 2010 and 2020, the amount of data created and consumed increased by 5,000% (Forbes, 2021).

The implementation of AI largely depends on the owners, management and employees of the company. After all, the optimization of business processes with the help of AI depends on them. According to the consulting company Accenture, 84% of top managers believe that artificial intelligence contributes to the growth of the company and optimizes work processes (Accenture, 2022).

In addition, implementation of AI in business processes became one of the main parts of business digitization. Digitalization of work processes has become a necessity to ensure further effective functioning of companies. It contributes to the automation of production, the creation of products and services based on digital technologies, the transition to the online of all communication activities of the company, which increases its value. The restructuring of business processes calls for the consideration of possible options and the justification of rational business decisions.

Digital transformation of the business processes is based on the following aspects:

1. Improvement of external communication. Companies personally approach the needs of each client, strive to speed up the order fulfillment, and ensure safe routes for the transportation of goods.

2. Reconstruction of the business model. Particular importance is attached to lean production, which is aimed at finding and minimizing (eliminating) all types of losses (overproduction, shortages, waiting time in the production process, unnecessary movement of workers, harming the health of workers, etc.) in the production process by striving to optimize the business of every employee of the company.

3. Rethinking work with data. In stable conditions, working with data, as well as forecasting indicators, was carried out using extrapolation (prediction based on the use of data from past periods). In today's conditions, forecasting based on the use of trends of past periods is impossible due to a significant difference in the environment. Changes require the implementation of new approaches to forecasting. Thus, the use of artificial intelligence makes it possible to make decisions in a situation with incomplete information. Artificial intelligence allows computers to perform mental processes, analyze, synthesize, compare and summarize data and build predictive trends on their basis. The use of artificial intelligence contributes to the acceleration and accuracy of tasks, as well as the release of employees from monotonous (routine) work.

Thus, business faces new technological and digital challenges, the answer to which was found in the use of AI. The current stage of AI development in business is initial; it is associated with risks and uncertainty of the results of using such a tool. Therefore, the optimization of business processes of companies with the help of AI is a wide field for research.

The aim of the paper is the systematization of the key approaches to implementation of artificial intelligence in business processes of the company and assessment of its influence on business results.

The structure of the paper is as follows: it is divided into 5 logically connected parts, including an introduction, literature review, and formation of relevant research hypotheses, which consider the impact of AI on business development. The next part of the research presents the results of the data analysis and their discussion. The final part of the work is devoted to conclusions, determination of advantages and disadvantages of AI in business, as well as its possible limitations.

2. Literature Review and Hypotheses Development

Modern studies pay attention to various aspects of the use of AI, especially to the role of AI in the development of business processes. There are different approaches to the implementation of AI, but it is always the construction of complex algorithms, their automation and the provision of computerized variable solutions.

Artificial intelligence methods are used due to permanent monitoring to forecast business processes (Mayer-Schönberger, Cukier, 2013) to predict their results and obtain key indicators for the formation of a systemic vision of the production process. It is important to determine the signs of the onset of crises or risks of certain business processes. Depending on the received data, a decision should be made regarding the leveling or correction of processes in general.

An enterprise's external business environment is monitored using digital data as the pool of information generated by actions and interactions on the Internet, including

everything from e-mail and instant messaging to video streaming, online banking, and social networking (Gralla, 2007, p. 1163). The information generated by these increasingly diverse online activities is transformed and stored as digital data (Michael & Lupton, p. 112).

The focus of research in recent years has been on business process monitoring methods to allow providing information about business processes to the enterprise. A business process can be understood as a set of well-defined, coordinated tasks and actions that should be performed traditionally or automatically in order to achieve a business goal.

Recently, the emerging field of predictive business process monitoring has used deep learning techniques to uncover potential business value. These works use recurrent neural networks, such as long-short-term memory (LSTM) and Gated Recurrent Units (GRU), and suffer from misinformation and inaccuracy (Brunk et. al., 2020).

Another important aspect is the study of the implementation of AI in the management of business processes of companies. Business Process Management (BPM), i.e., a generic software system driven by explicit process designs to implement and manage operational BPs, enables organizations to be more efficient and capable of automating processes throughout the process management lifecycle (Beheshtiet. al., 2011; Beheshtiet. al., 2016; Beheshtiet. al., 2018a; Beheshtiet. al., 2018b).

Based on this, we can form the first hypothesis of our research:

H1: AI has a positive impact on the overall success of organizations from various industries, leading to increased business investment in AI development.

The research also emphasizes the role of intellectual analysis of business processes and their optimization with the help of AI tools. It bridges the gap between traditional BPM and data-driven analysis methods such as machine learning and data mining (Van Der Aalst, 2016; Van Der Aalstet. al., 2018; Amouzgaret. al., 2018; Schiliroet. al., 2018). Despite the popularity and many advantages of using AI in business, there are also a significant number of controversial points and disadvantages. In particular, these are the risks of mistakes, insufficient data, and possible harm to businesses, people, etc. Therefore, it allows us to define the following research hypothesis:

H2: The implementation of AI in business processes has its advantages and disadvantages, which confirms the need to regulate the use of AI.

3. METHODOLOGY

To analyze the role of AI in the development of the company's business processes we need to understand its spread in business environment and economy as a whole, involvement of different industries and workplaces. Empirical research uses quantitative methodology. Secondary data is collected from surveys and reports of leading world consulting companies. Data analysis is performed using the techniques of the MS Excel program package. Also we used methods of systematization and generalization to provide a summary for our key findings.

First of all, it is necessary to emphasize the «point of origin» for AI. The concept of artificial intelligence as a science was formulated by Dartmouth College professor John McCarthy in his 1955 proposals for the Dartmouth conference in 1956: "Artificial intelligence (AI) is the science and technology of creating intelligent machines, especially intelligent computer programs", and the apogee of scientific research was the well-known Turing test (Turing, 1950).

Artificial intelligence today is the ability of machines and programs to analyze received information, draw conclusions, and make decisions based on them. The key characteristic of AI devices is the ability to constantly learn, accumulate knowledge and successfully apply it, that is, it is the ability to perform those actions performed by the human brain (Skopenko et al., 2022).

Artificial intelligence (AI) applies advanced methods of analysis and logic, including machine learning, to interpret events, support and automate decisions and perform actions (Skopenko et al., 2022).

Artificial intelligence is a broad concept that includes many directions, methodologies, tools, algorithms and systems:

1. Machine learning (ML) – studies methods of building algorithms;
2. Deep learning (DL) – focuses on data classification;
3. Artificial neural networks (ANN) - reproduces the work of the human brain;
4. Natural language processing (NLP) - specializes in speech recognition technologies.

For now, all these instruments are implemented in business processes of companies from different industries. According to Deloitte research (Deloitte, 2022), the rapid growth of the artificial intelligence market is observed in many countries of the world. Industry leaders (approximately 94%) confirm the important role of AI in the 5-year perspective of business development (Fig. 1). However, as the pace of AI usage increases, the results begin to lag behind - because there are more players on the market, more requests, and AI capabilities still need additional development.

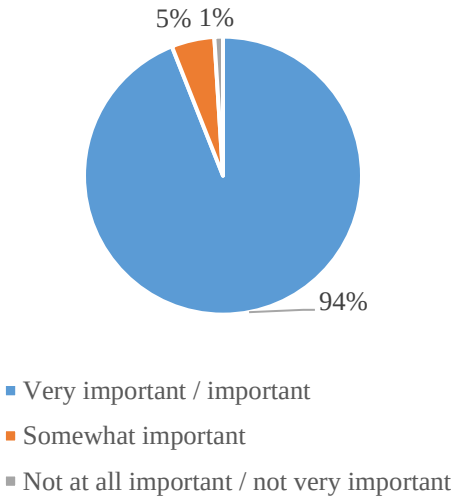

Fig. 1 Importance of AI solutions for organization's overall success
Source: Deloitte, 2022

A study by Deloitte in 2022 confirmed the intensification of the deployment of AI among business representatives, but the results are not high (Deloitte, 2022). According to the reported data, 79% of participants were able to implement 3 or more types of AI solutions, which shows an increase of 17% compared to 2021. At the same time, the

"Lagging" category (High employment / Low academic performance) increased to 22% from 17%. It is important to note that despite the challenges of implementing AI in business processes, 76% of respondents are ready to increase investment in AI to gain more benefits (Fig. 2). The first investment boom has slowed down, but only 3% of survey participants plan to reduce investments in AI. That is, it is appropriate to expect only the expansion of the possibilities of using and financing the development of business solutions based on AI.

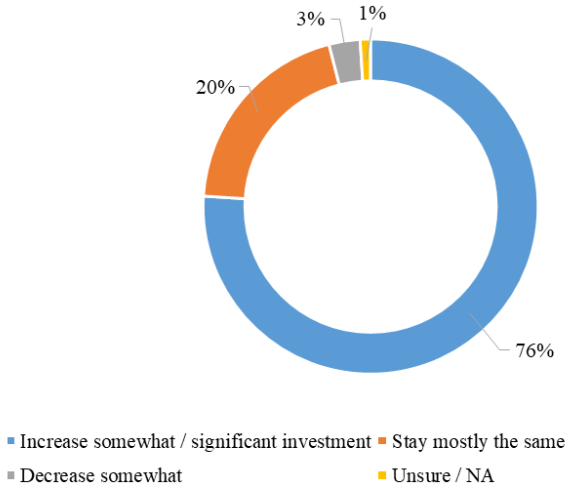

Fig. 2 Expected AI investment in 2023 fiscal year
Source: Deloitte, 2022

Accordingly, we note that AI is one of the key trends in business development in recent years. The development of business solutions based on AI requires significant investment, time and highly qualified specialists. At the same time, business representatives themselves recognize the critical role of AI solutions in competition and are not going to give up the benefits of its use.

4. Research Results and Discussion

A more detailed study of the results of global research (Deloitte, 2022; Gartner, 2023; Forbes, 2021) on the spread of AI in various areas of economic activity revealed the leading industries and business processes associated with the introduction of AI.

According to a Forbes Adviser survey (Forbes, 2021), more than 600 business owners in the US are already using or planning to implement AI solutions. 37% of respondents are implementing AI in advertising and marketing to perform daily work tasks. At the same time, the field of healthcare uses AI to a more limited extent - only 15% of respondents use AI in this field (Fig. 3). It can be explained by flexibility and creativeness of marketing sphere and more complicated and related to life-saving activities of healthcare.

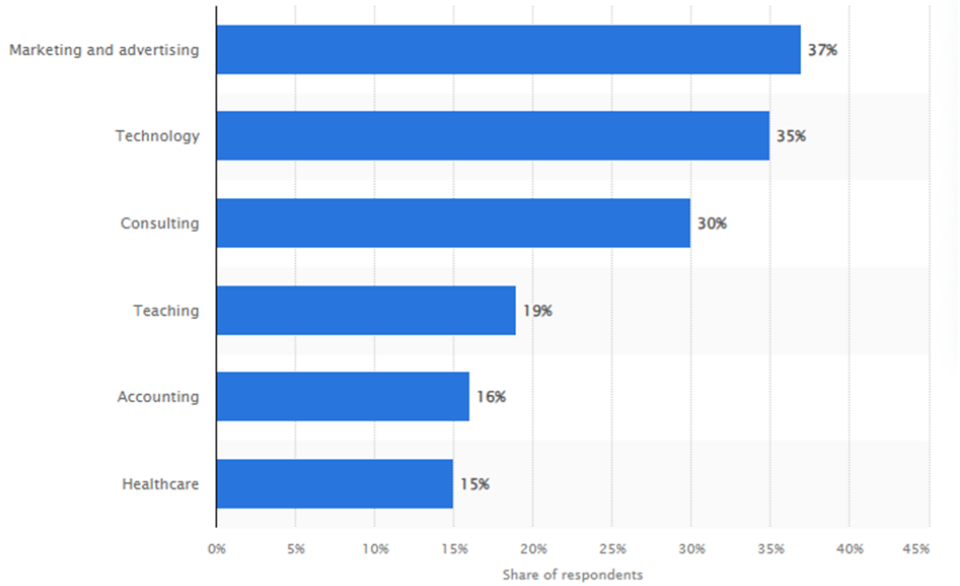

Fig. 3 AI adoption rate at work by the industry in USA
Source: Statista, 2023

According to a Harvard Business Review study (Harvard Business Review, 2016), companies that use artificial intelligence for sales can increase the number of leads by at least 50%, reduce call times by 60-70%, and reduce costs by 40-60%.

The Artificial Intelligence Index Report 2023 (AI Index Report, 2023) tracks the development of AI through trends in research and development (R&D), technical productivity, ethics, as well as economics, politics, public opinion and education.

The field of data management and processing and cloud technologies is the leader in the amount of investments in AI - 6.1 billion US dollars, followed by medicine and health care, as well as fintech with 6% of the world funding of artificial intelligence in 2022.

Globally, AI private investment declined by 26.7% in 2022 while the broader corporate investment landscape, which also includes AI mergers and acquisitions (M&A), minority stakes and public offerings, pulled back by 31.3% (Fig. 4).

Companies that have already started implementing AI solutions report both cost reductions and optimization, as well as increased revenues. On the cost side, AI adoption has had the biggest impact on supply chain management (52%), service (45%), risk (43%), and strategy and corporate finance (43%).

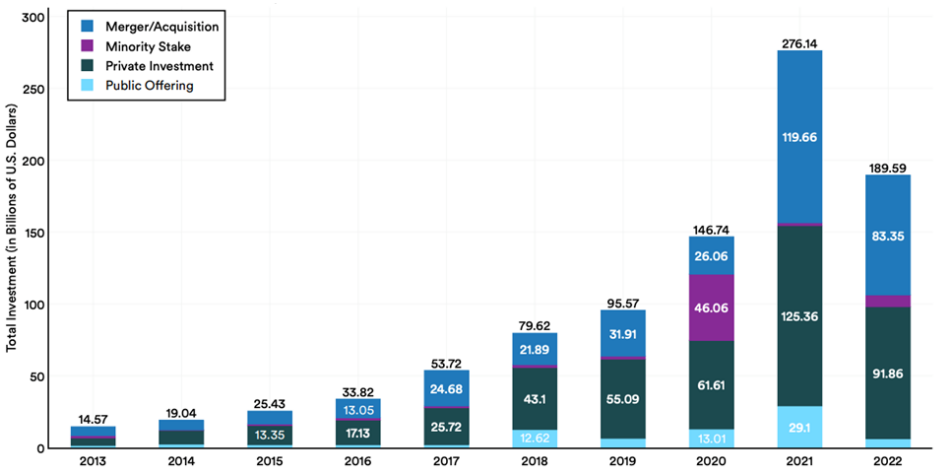

Fig. 4 Global Corporate Investment in AI by Investment Activity, 2013-2022

In terms of revenue, most respondents admitted an increase in revenue as a result of AI implementation: marketing and sales (70%), product and/or service development (70%), and strategy and corporate finance (65%) (Fintech News Switzerland, 2023).

The analysis of secondary data allows us to confirm the first hypothesis (H1) of the study, namely: the implementation of artificial intelligence tools has a positive effect on the company's success, because it allows optimizing business processes, reducing costs and obtaining greater profits. Moreover, it increases the competitiveness of the company and allows to speed up digitalization.

In turn, based on the results of the systematization of secondary data (obtained during the analysis of surveys of consulting companies), we can highlight the following advantages and disadvantages of using AI in business.

Advantages and possible directions of using AI in business:

1. Makes recommendations: companies use artificial intelligence to recommend products that will suit customers' interests. This is how streaming services YouTube and Netflix work. By analyzing the types of movies and shows you watch, platforms offer similar content.

2. Segmentation of the audience in marketing campaigns: for the effectiveness of marketing campaigns, AI collects and processes information about users. This allows you to segment the audience and create individual offers for each segment.

3. Data collected by AI is also used for offline sales. For example, thanks to AI, it is possible to monitor the stocks on the shelves and check the freshness of perishable goods in supermarkets.

4. Optimizes production processes: technologies simplify work and are able to perform repetitive operations better than humans. Therefore, artificial intelligence is used in accounting and logistics; it is used in factories to control the quality of products. In the fall of 2022, tractor manufacturer John Deere introduced a robotic tractor. The tractor's six cameras use artificial intelligence and allow you to recognize obstacles and maneuver, detect weeds among crops, and use less seed material.

5. Explores customer loyalty: using artificial intelligence and machine learning, companies collect data on how potential customers perceive the brand. For example, AI

studies social media posts about a brand. The information obtained as a result of this analysis allows companies to improve.

6. Protects against fraud: in the financial industry, AI analyzes and identifies suspicious transactions using machine learning algorithms. When there is a risk of fraud, the program stops the transaction and notifies you about it.

7. Increases workplace safety: construction companies, utilities, farms, mining companies, and other organizations where work involves risk to human life use AI to collect and analyze data from cameras, thermometers, motion detectors, and weather sensors. Collected information helps identify problematic behavior or unsafe conditions and provide timely warning.

8. Helps in search optimization: machine learning algorithms help to better understand the essence of the search, are able to analyze the SEO strategy of competitors and find key queries that are not used by competitors.

9. Classifies risks: in the insurance industry, artificial intelligence is used to process data about driving behavior to predict risks. For example, driving at a speed of 100 kilometers per hour is safe on the highway, but not in the city. In the industrial sector, AI can predict when equipment needs to be repaired and suggest the best time to do so.

10. Solves court cases: lawyers know the law, but AI can process information much faster. Recently, Colombian judge Juan Manuel Padilla used ChatGPT to decide a case.

11. Helps HR professionals: with the help of artificial intelligence, HR managers can analyze the previous work experience and interests of a potential candidate to find the best candidate.

12. Facilitates Learning: many organizations use artificial intelligence for learning. AI allows you to tailor the curriculum to each student's unique needs and level of subject awareness.

Next, let us consider the possible risks and shortcomings of AI implementation:

- Job loss: 85 million people are expected to lose their jobs between 2020 and 2025 due to process automation.
- Social manipulation: changing the mood/behavior of users of social networks, manipulation of news, lack of ability to filter harmful content in some networks.
- Violation of human rights: use of facial recognition technology in offices, schools, and other public places, tracking people's movements without permission.
- AI-based autonomous weapons: AI-based systems that independently detect and destroy targets can be built. The danger is that such weapons can fall into the hands of terrorists.
- Financial crises due to AI algorithms: the financial industry most often involves AI to solve many problems. Therefore, experts predict that possible errors in algorithms can cause a financial crisis.

Thus, there are serious risks in the use of AI both in everyday life and in the company's business processes. Lack of legislation, ethical standards, and control over the use of AI can lead to data loss and even severe physical or moral harm to a person. So this supports our second hypothesis H2: The implementation of AI in business processes has its advantages and disadvantages, which confirms the need to regulate the use of AI.

5. CONCLUSIONS

AI development and investment in digitalization represent a breakthrough in the technological development of society and business. In the future, the application of AI will help to solve complex and non-trivial tasks: for example, in the field of energy and environmental protection. Artificial intelligence has great potential for achieving important scientific and practical tasks in the field of business process management. For example, the application of machine learning and deep learning algorithms makes it possible to identify complex patterns in data and develop new management strategies. Also, AI can be used to forecast market trends, analyze the competitive environment, and strategic planning. AI systems can be used to automatically analyze market trends, identify new opportunities, and develop innovative products. AI can help determine optimal development strategies and resource planning, which contributes to achieving competitive advantages in the market.

Global companies are approaching the future already now, applying the system in various fields. Therefore, artificial intelligence has great potential for use in business process management systems. It provides automation, increases efficiency, reduces costs, and improves the quality of solutions. However, it is necessary to take into account the shortcomings and limitations associated with the availability of quality data and the integration of systems. The use of AI requires careful planning and analysis but can be a powerful tool for success in business process management. However, it is important not to forget about the risks: in particular, the high probability of system mistakes.

Thus, artificial intelligence has become an integral part of the modern world and can be successfully used in business process management systems. Its advantages are the ability to analyze large volumes of data, identify complex dependencies, make predictions, and make objective decisions based on algorithms.

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ULOGA VEŠTAČKE INTELIGENCIJE U RAZVOJU POSLOVNIH PROCESA KOMPANIJE

Vođenje posla u uslovima globalizacije i brzih promena zahteva od preduzetnika stalni razvoj i prilagođavanje, potragu za novim idejama i korišćenje naprednih tehnologija. Aktivna konkurencija i funkcionisanje u nesigurnim uslovima zahtevaju stvaranje novih konkurentnih prednosti, efikasno upravljanje poslovnim procesima i digitalnu pismenost. Cilj ovog rada je sistematizacija ključnih pristupa implementaciji veštačke inteligencije u poslovnim procesima kompanije i procena njenog uticaja na poslovne rezultate. Empirijsko istraživanje koristi kvantitativnu metodologiju. Sekundarni podaci su dobijeni uz pomoć upitnika i izveštaja o radu vodećih konsalting kompanija. U okviru istraživanja, proučavana je suština i ključni pravci razvoja veštzačke inteligencije. Sprovedena je analiza korišćenja veštačke inteligencije u poslovnim procesima kompanije. Razmatrani su pozitivni primeri implementacije veštačke inteligencije, određeni su uticaji AI rešenja na razvoj modernih organizacija. Razmatrane su mane i prednosti korišćenja AI rešenja na poslovanje.

Ključne reči: *AI, veštačka inteligencija, poslovanje, poslovni process, razvoj*