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ARTIFICIAL INTELLIGENCE AS A DRIVER OF THE DEVELOPMENT OF MODERN BUSINESS

A key success factor of modern companies is the timely restructuring of business processes, taking into account the penetration of digital technologies in all spheres of society. Nowadays, the challenges have accelerated the implementation of modern business concepts. Continual improvements become the vital step in competitive market. Digitalization has become an unavoidable reality for companies.

The article investigates the meaning of the terms "digitization", "digitalization" and "digital transformation". It is proved that digitalization provides companies with competitive advantages in all areas of activity, which is reflected in the optimization of production processes, costs minimization, decreasing errors, increasing speed of delivery, boosting the quality of finished products (services), improving the control of the company's data and processes, increasing the effectiveness of communication. Examples of companies that use digital technologies and the results of their implementation in business processes are given. The results of survey confirm the positive effects of digitalization of business.

Three main types of artificial intelligence are distinguished: artificial narrow intelligence, general artificial intelligence, artificial superintelligence and the differences of each are outlined. The benefits and the main threats of artificial intelligence are revealed. The global artificial intelligence industry is expected to grow from $59.7 billion in 2021 to $422.4 billion by 2028, according to Zion Market Research. The 2020 McKinsey Global Survey on Artificial Intelligence (AI) confirms that 50% of companies have reported using AI in at least one business function. The experience of the world's largest companies in the implementation of various artificial intelligence tools in operational activities is presented. It is emphasized that artificial intelligence contributes to business development and global economic activity. The growth of key performance indicators after the implementation of artificial intelligence in the business processes of companies is presented.

***Keywords**: digitalization; artificial intelligence; business processes.*

Problem statement. Dynamic modern environment and the willingness of companies to develop their activities stimulate them to implement changes in business processes. Last years companies faced new challenges such as: the COVID-19 pandemic, increasing prices of food and other key commodities, decreasing in purchasing power, war in Ukraine. Different problems demanded reasonable solutions – what worked excellent years ago might now be impossible at all. Identifying the key drivers to success, companies made changes in business models prioritizing ways of future growth.

Review of recent publications. Scientific researches of sustainable enterprise development implementing digitalization and artificial intelligence are reflected in the works of well-known scholars as Brennen S., Chen Y., De Clerec J., Durst S., Ferreira J., Heavin C., Honore T., Jaw, Y., Kailer N., Kraus S., Power D., Veiga P., Weinmann A., Vial G., Wu B. and others [1-7].

Statement of research gap. Considering a dynamic market environment, the companies should adapt their activities due to challenges of nowadays, develop appropriate measures to survive and growth of their business.

The purpose of the paper is to analyze the influence of artificial intelligence implementation on growth and the development of companies.

Research methodology. In the research process the abstract-logical methods (theoretical generalization, formation of conclusions), methods of system analysis (gathering information, analyzing of indicators of companies development) were used.

The results of the study. In a highly dynamic environment, the changes in doing business became the vital topic for nowadays discussion. The most important aspects of such transformations for Ukrainian companies became optimization of production cycles, improvement of customer services through minimizing terms of goods delivery, increasing of product quality by restructuring business processes.

Changes in purchasing power and expectations of clients force companies to maintain and develop competitive advantages to operate effectively. It should be noted that except popular methods of developing of competitive advantages, digitalization became the essential for business success nowadays. Such tendencies of changing in business processes are characterized by the desire of companies make positive changes in the production systems, to reorganize activities for achieving higher effectiveness of business processes. The goal of the business is transformed from making profit to offering the best goods or services to the client in the shortest period of time and providing value to all stakeholders of the company. This goal should be ensured by specific measures, taking into account the achieved positions, specifics of the companies' business, market competition.

Digital technology can be used to understand and manage resources in better way, increase companies efficiency. There are a variety of terms related to this that are noted such as digitization, digitalization, digital transformation (Table 1).

Table 1

The meaning of digitization, digitalization, digital transformation

Author(s) or internet sources	Definition
Digitization	
Digitization vs. digitalization: Differences, definitions and examples [8]	conversion of data, documents and processes from analog to digital.
The Differences Between Digitization, Digitalization, and Digital Transformation in Manufacturing [9]	the process of making information available and accessible in a digital format.
Digitalization	
Gartner Glossary [10]	the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.
IGI Global [11]	the process by which companies reorganize their work methods and strategies to obtain greater benefits thanks to the implementation of new technologies.
J. Clerck [12]	is defined as the use of digital technologies and of data in order to create revenue, improve business, replace/transform business processes and create an environment for digital business.
W. Crittenden et al. [13]	creates new forms of interaction between companies and customers through channels.
Digital transformation	
J. Hummel [14]	the coordinated digitalization change efforts at scale.
The Differences Between Digitization, Digitalization, and Digital Transformation in Manufacturing [9]	the process of devising new business applications that integrate all the digitized data and digitalized applications.
Olechowski A. [15]	is about reinventing the business with technology. It's a transition in how organizations use digital technologies to add value to customer interactions and invent new business models.

Source: Compiled by the authors

Digitization describes the pure analog-to-digital conversion of existing data and documents. The data itself is not changed — it's simply encoded in a digital format. Digitization can reap efficiency benefits when the digitized data is used to automate processes and enable better accessibility — but digitization does not seek to optimize the processes or data [8].

Access to digitized information is at the core of digitalization initiatives. Digitalization doesn't go as far as changing business models or creating new types of businesses - it's more about keeping on doing what we do but being faster and better at it because our data isn't trapped in a dusty archive [15].

Digitalization is about the improvement of workflows and processes, changes in supply chain relationships, and the application of knowledge and information rather than 'just data'. Digitalization allows manufacturers to manage day-to-day performance safely and reliably, learn from the past and respond to future swings in market dynamics, drive innovation, create value, improve safety, and improve resource management (Figure 1) [9].

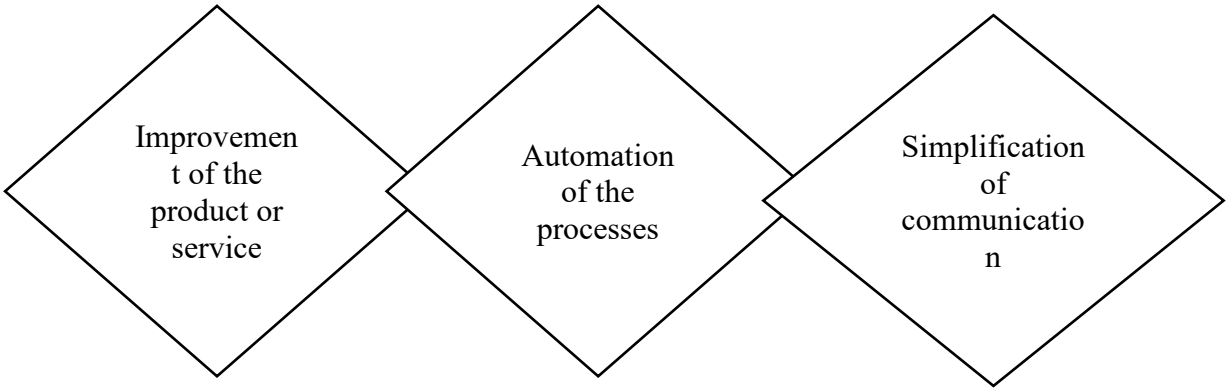


Figure 1. Goals of digitalization
Source: [16].

To stay competitive, companies continually revise the range of products, offer innovative products or products with special characteristics, improve the rhythm of production, ensure high productivity, rational use of equipment, reduce cycle times, which positively affect to the quality of products or services. Automation gives positive results as minimizing costs, decreasing errors, increasing speed of delivery, boosting quality indicators, improving the control of the company's data and processes, including workflow, resources and profitability, simplifying the business operations, improving the effectiveness of communication.

Digital technologies opened the door to new ideas about process acceleration but also the creation of entirely new processes. These new ideas are the driver behind digital transformation [15].

Yokogawa defines digital transformation as the novel use of digital technology to accelerate business strategy. It is about the application of digital technologies to empower people, optimize processes, and automate systems in the organization to radically reorient its business performance [9].

The main benefits of digital transformation adaption are: faster collection and analyzing of data, better allocation of resources, developing strong competitive advantages, better customer satisfaction, increasing financial indicators and productivity, improving decision making process.

Thus, continual improvements become the vital step in competitive market. Comparing the business models of companies two years ago and nowadays, we can emphasize the significant differences. Such changes reflect positive on the company's activities and clients expectations. Digitalization has become an unavoidable reality for companies.

Digital technologies lead companies to gain huge benefits from them. As technology becomes more and more sophisticated, the adoption process becomes more challenging. Some digital technologies require deeper understanding and certain skills to master them to take real advantage. So companies must start prioritizing measures to implement digital technologies.

Analyzing the changes in the external environment and the main challenges facing the companies, we can noted that the COVID-19 pandemic was one of the important factors that influenced much on the intensification of the integration of artificial intelligence into business processes. Being in crisis conditions, companies have revised their plans, rebuilt the methods of doing business, and implemented modern practices in their everyday activities.

Thus, AB INBEV EFES Ukraine has launched a new B2B platform “ViBEERray” which in the context of the pandemic and other challenges contributed to the rapid adaptation of the enterprise to changing conditions and created an opportunity not to lose the sales volume. The platform allows large retail companies, retail stores, restaurants to order products anytime, as well as receive online consultations on all product items. This helps to reduce the time for placing orders, getting the opportunity to become a member of the loyalty program. In March 2021, 15% of product sales were carried out through the platform “ViBEERray” [17].

Companies that have significant financial resources for the development of digital technologies implement a digital transformation in full-scale business cycle. For instance, the portfolio of digital initiatives of the project office of Metinvest Digital (the largest metallurgical company in Ukraine) annually includes approximately 100 projects and more than 800 applications for improving existing systems [18]. The digital transformation management process of the international group of companies Metinvest, which includes more than 30 enterprises, is carried out at three levels: Business Engagement, Solutions Delivery, Operations.

At the level of Business Engagement, digital partners are responsible for the formation of business needs for digital transformation, as well as the initial assessment of digital initiatives. Business Engagement is responsible for interaction between Metinvest Digital and the Group's companies. These are specialists who are at the intersection of business, technology, production and project management. They deeply understand the specifics of Metinvest's production and business processes. At this level, the needs and ideas of the digitalization business were formed and evaluated, and future projects are born.

To manage the portfolio of implementations at the Solutions Delivery level, an own project office was created to develop and implement IT projects. At the same level, the R&D Co-Innovation Centre is responsible for the possibility of using emerging technologies in various business areas of the Metinvest Group's business. The center's specialists test artificial intelligence technologies, machine learning, process robotics, computer vision and much more.

At the operational level (Operations), the company is responsible for supporting the implemented technologies and IT services for the Group's companies (the development of

IT infrastructure, information systems, digital workplace and ensuring information and cybersecurity).

Thus, Metinvest Digital focuses on an integrated approach to digital transformation project management, covering all key technological and business processes of the group: production, repairs, finance, procurement, logistics, personnel management, sales, business intelligence.

More and more executives agree that the digital technologies will change the way their organizations operate. According to the McKinsey Digital Quotient survey of April 2019, 93% of executives believe that digitalization is critical for achieving their strategic goals [19].

To highlight the benefits and barriers organizations face on the road to digitalization, PTC and Corporate Leaders conducted an international, multi-sector survey in April-May 2018. The survey findings suggest that the organizations that have digitalized their processes have leveraged digital data in customer services, digital operations, manufacturing, and benefited from internet-connected products across a range of engineering applications. The top three benefits of adopting a digital model cited by the survey respondents were improved operational efficiency (40%), faster time to market (36%), and meeting changing customer expectations (35%). Close behind in joint 4th place (each on 26%) are improved product quality, increased design re-use and improved new product throughput (Figure 2) [20].

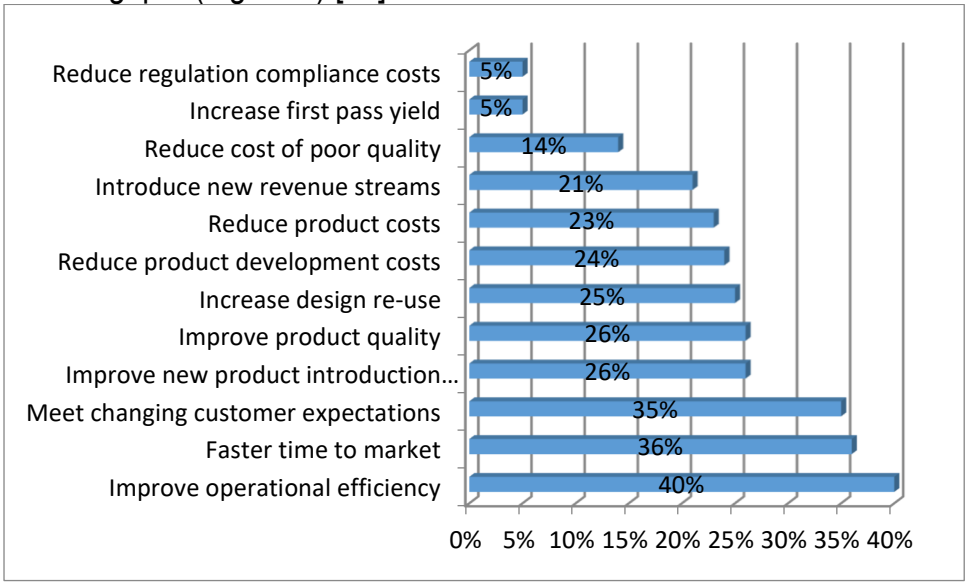


Figure 2. Top benefits of adopting a digital model
Source: [20].

The most successful companies are the quickest to embrace digital technologies: 52% of companies with more that €1b revenue are already in the process or have completed the digital transformation, compared to just 22% of companies with up to €50m and between €200m - €1b in revenues, and only 4% of companies between €50m - €200m of revenue [21].

Key digital technologies (automation, artificial intelligence, sophisticated analytics, internet of things, augmented and virtual reality) are constantly evolving and gaining more

and more applications. Therefore, to remain competitive and take advantage of new opportunities companies need to fundamentally rethink its organizational structure, processes and should take into account changes in customer behavior, opportunities for business model transformation, business assets and social distancing.

There are 3 types of artificial intelligence (AI): narrow or weak AI, which has a narrow range of abilities; general or strong AI, which is on par with human capabilities; and artificial superintelligence, which is more capable than a human [22].

Artificial narrow intelligence (ANI) is goal-oriented, designed to complete the specific tasks (facial/speech/voice recognition etc.).

Artificial general intelligence (AGI) is the intelligence of machines that allows them to comprehend, learn, and perform intellectual tasks much like humans [23].

During the COVID-19 pandemic, the development of AI had been progressing faster than ever before. Companies deal more with AI algorithms and tools to rebuild and improve their business operations, for instance, provide voice-based instructions to complete complex tasks, use chatbots, robotic process automation (RPA).

Artificial super intelligence (ASI) doesn't just mimic or understand human intelligence and behaviour; ASI is where machines become self-aware and surpass the capacity of human intelligence and ability [22]. Elon Musk and other researchers worry about control issue of superintelligent creatures.

From deep learning to chatbots and image recognition, AI and machine learning are revolutionizing how businesses are able to engage with customers and deliver more in less time. AI technology can be applied in many different use cases across industries of all varieties, including healthcare, sales, HR, operations, manufacturing, marketing and of course, technology. Commonly discussed use cases for AI include self-driving cars and other autonomous technology, internet of things (IOT), medical diagnosis, robotic assistance in manufacturing, contactless shopping, job candidate selection and so much more. The possibilities for business are boundless [24].

The global artificial intelligence industry is expected to grow from $59.7 billion in 2021 to $422.4 billion by 2028, according to Zion Market Research. Virtually every industry is being disrupted by AI, automation and robotics. Whether it be machine learning, smart applications and appliances, digital assistants or autonomous vehicles, companies that aren't investing in AI products and services risk becoming obsolete [25].

According to the 2020 McKinsey Global Survey on Artificial Intelligence (AI), 50% of companies have reported using AI in at least one business function (Figure 3) [26].

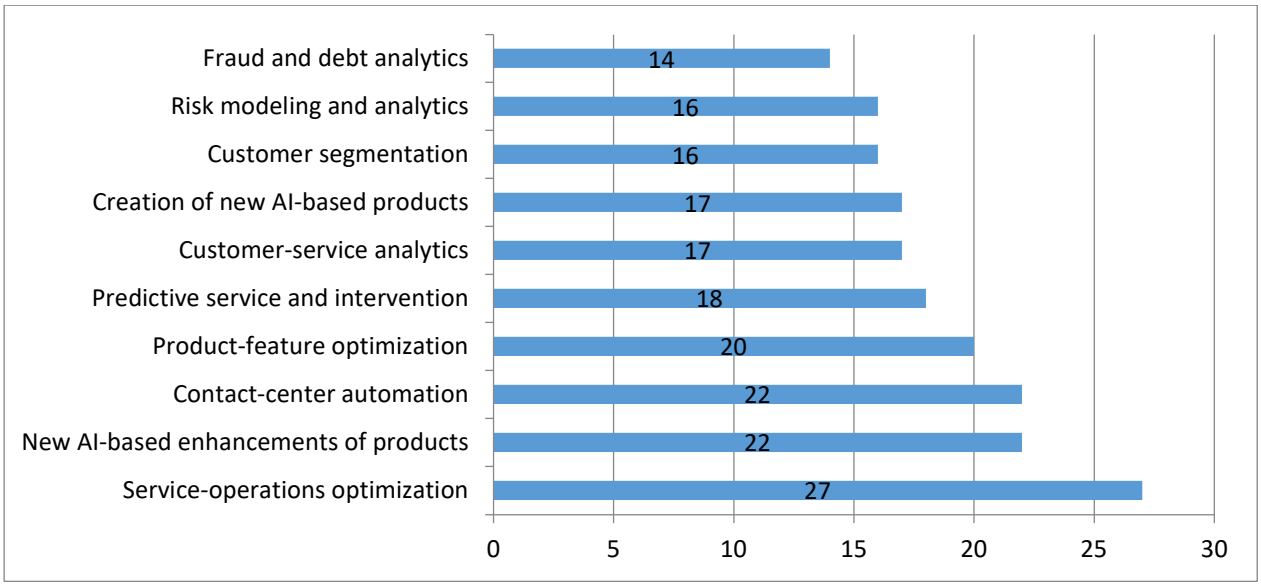


Figure 3. Using AI in specific functional activities, % of respondents

Source: Compiled by the authors on basis of [27].

AI adoption, which is most common, is service operations, product and service development, marketing and sales. The key companies in the AI market are: Google, Apple, Facebook, Amazon, Microsoft, IBM, Intel, Nvidia.

Google is amongst the top AI companies. Its aim is to aggregate the world's information and make it accessible and helpful to everyone, individuals or enterprises. Google AI is undertaking cutting-edge research in the area, applying AI to products and new fields, and building tools to guarantee that everyone has access to AI. In September 2021, Google stated that it would use AI innovations, particularly a new technology called Multitask Unified Model (MUM), to enhance Google Search. At the Search On event, the business showed new capabilities, including those that use MUM, to better link web searchers to the information they're looking for, while also making web search seem more natural and intuitive. One of the new features is called "Things to know," and it aims to make it easier for users to comprehend new topics they're looking for. This feature learns how people investigate different topics and then displays web searchers the aspects of the topic that they are most likely to look at first [26].

Microsoft provides AI technology to help users write better, display maps and charts in Excel, and simplify the email. Microsoft Dynamics 365 powers digital transformation with cloud business apps enhances business operations by leveraging customer data and insights, LinkedIn integration, and intelligent technologies such as machine learning and predictive analytics.

AI enables Amazon to automate elements of the fulfillment and delivery network and serves as the foundation for Alexa's ability to assist users to play music, check the news and weather, switch on the lights, order a pizza or a cab, and more easily by using their voice. Amazon believes that artificial intelligence will fundamentally enhance the way it provides customers with ease, cheap costs, and a wide range of options. In 2021, Amazon introduced Astro, a canine-like domestic robot. The Amazon Astro is a modern

autonomous robot in the Wall-E style from Amazon that combines Alexa and AI capabilities with wheels. The Astro is a robot pet with a periscope camera and live stream, as well as Ring Protect Pro support and other capabilities. Astro will have its own functions, such as beatbox and rest on demand, and will be more than simply Alexa on wheels [28].

Thus, the use of AI poses significant business benefits. Many complicated tasks can be automated with AI, reducing time period of producing and delivering goods. Human resources can concentrate their attention on managing business processes. AI facilitates cost reduction, minimizes human errors, boosts revenue. The results of McKinsey Global Survey on AI illustrate these effects (Figure 4).

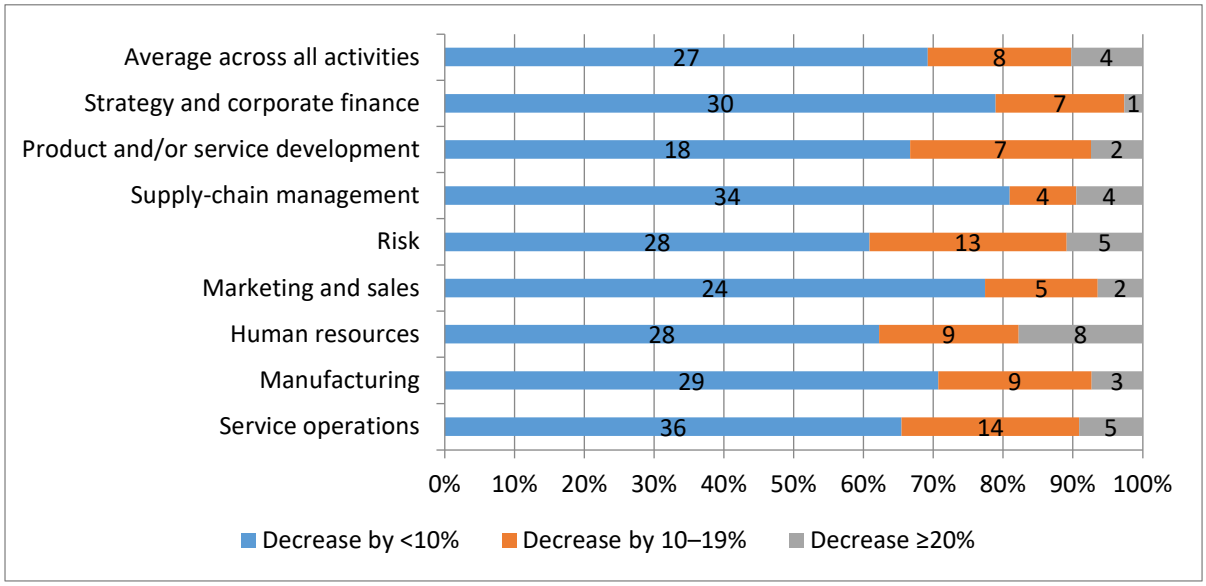


Figure 4. Cost decrease from AI adoption by function in 2020, % of respondents
Source: [27].

Question was asked only of respondents who said their organizations have adopted AI in a given function. Respondents who said "no change," "revenue decrease," "not applicable," or "don't know" are not shown.

AI adaptation brings positive effects: increasing of productivity, redeploying of employees to solve more complex tasks using critical thinking, faster access of clients to improved products or services. Also, reducing the operating costs of business generates more revenue (Figure 5).

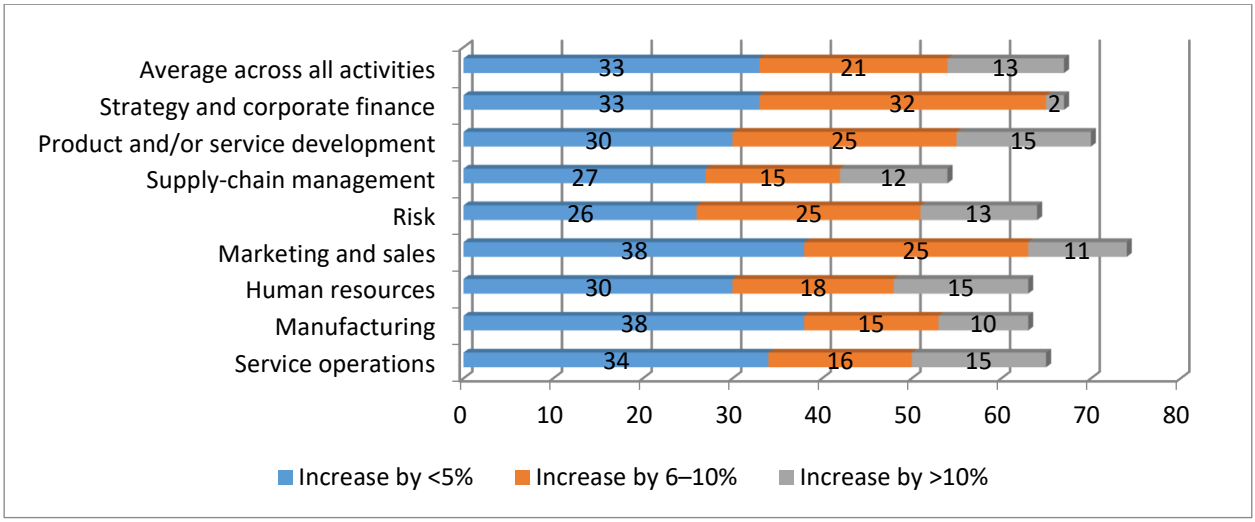


Figure 5. Revenue increase from AI adoption by function in 2020, % of respondents
Source: [27].

Revenue increase enables companies to restructure processes, implement modern technologies and innovative products, expand a business.

Conclusions. Digitalization and the use of artificial intelligence have a positive impact on the productivity of production processes, reducing resource consumption, speeding up processes, increasing the safety of production and ensuring the efficiency of the functioning and development of companies. Business digitalization contributes to the adaptability of a business entity to rapid changes in the external environment, resulting in an increase in its competitiveness.

Prospects of further research may focus on studying the experience of international companies that occupy the top positions in the introduction of artificial intelligence in business processes to implement the best practices of digital transformations in the activities of domestic business entities.

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ШТУЧНИЙ ІНТЕЛЕКТ ЯК ДРАЙВЕР РОЗВИТКУ СУЧАСНОГО БІЗНЕСУ

Ключовим фактором успіху сучасних компаній є своєчасна перебудова бізнес-процесів з урахуванням проникнення цифрових технологій в усі сфери життя суспільства. Виклики сьогодення прискорили впровадження сучасних бізнес-концепцій. Постійні вдосконалення для компаній стають життєво важливим кроком в конкурентному середовищі. Цифровізація стала невід'ємною реальністю для сучасних компаній.

У статті досліджено зміст термінів "оцифрування", "діджиталізація" та "цифрова трансформація". Доведено, що діджиталізація надає компаніям конкурентні переваги в усіх сферах діяльності, що відображається в оптимізації виробничих процесів, мінімізації витрат, зменшенні помилок, збільшенні швидкості доставки, підвищенні якості готової продукції (послуг), покращенні контролю над даними та процесами компанії та підвищенні ефективності комунікацій. Наведено приклади компаній, які використовують цифрові технології та результати їх впровадження в бізнес-процеси. Результати опитування підтверджують позитивні ефекти від діджиталізації бізнесу.

Виділено три основні види штучного інтелекту: штучний вузький інтелект, загальний штучний інтелект, штучний суперінтелект та окреслено відмінності кожного з них. Розкрито переваги та основні загрози штучного інтелекту. Очікується, що світова індустрія штучного інтелекту зросте з $59,7 млрд. у 2021 році до $422,4 млрд. до 2028 року, згідно з даними Zion Market Research. Глобальне дослідження McKinsey 2020 року щодо штучного інтелекту (ШІ) підтверджує, що 50% компаній повідомили, що використовують ШІ принаймні в одній функціональній сфері бізнесу. Представлено досвід найбільших світових компаній з впровадження різних інструментів штучного інтелекту в операційну діяльність. Підкреслено, що штучний інтелект сприяє розвитку бізнесу та глобальній економічній активності. Наведено зростання ключових показників ефективності після впровадження штучного інтелекту в бізнес-процеси компаній.

Ключові слова: *діджиталізація; штучний інтелект; бізнес-процеси.*