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ШТУЧНИЙ ІНТЕЛЕКТ ТА ІНТЕЛЕКТУАЛЬНА ВЛАСНІСТЬ: МОЖЛИВОСТІ ТА ВИКЛИКИ

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ARTIFICIAL INTELLIGENCE AND INTELLECTUAL PROPERTY: OPPORTUNITIES AND CHALLENGES

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Анотація.*У статті досліджено сутність та особливості технології Штучного інтелекту. Визначено, що основними складовими даної технології є наступні елементи: навчання, міркування, вирішення проблем, мова обробки, сприйняття.Окреслено особливості та ключові відмінності сильного (загального) та слабкого (вузького) штучного інтелекту, проаналізовано їх відмінності на реальних прикладах. Встановлено, що найближчим часом очікується стрімке поширення застосування даної технології як у сфері бізнесу, так і у соціальній сфері, державному управлінні, тощо.Визначено основні переваги від застосування ШІ для всіх учасників бізнес-екосистеми та ідентифіковано потенційні загрози.*

Ключові слова: *штучний інтелект, інтелектуальна власність, можливості, загрози, екосистемний підхід.*

Annotation.*The article examines the essence and features of Artificial Intelligence technology. It was determined that the main components of this technology are the following elements: learning, reasoning, problem solving, language processing, perception. Features and key differences of strong (general) and weak (narrow) artificial intelligence are outlined, their differences are analyzed using real examples. It has been established that in the near future the rapid spread of the application of this technology is expected both in the business sphere and in the social sphere, public administration, etc. The main advantages of the application of AI for all participants of the business ecosystem were determined and potential threats were identified.*

Key words: *artificial intelligence, intellectual property, opportunities, threats, ecosystem approach.*

The era of Industry 4.0 is marked by the rapid spread of the introduction of digital technologies, including Artificial Intelligence [1]. According to ISO/IEC 22989:2022, Artificial intelligence (AI) is “a technical and scientific field devoted to the engineered system that generates outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives” [2]. As noted by WIPO, AI is generally considered to be a discipline of computer science that is aimed at developing machines and systems that can carry out tasks considered to require human intelligence [3]. Examples of AI technologies include robotics, autonomous vehicles, computer vision, language, virtual agents, and machine learning.

AI is a tool used to solve practical problems. The quality of its use depends on the algorithms and machine learning methods that guide its actions. The main requirement is to obtain a large array of data necessary for its training. Thus, by analyzing large volumes of data using a neural network, certain patterns are identified and predictions or solutions are developed. A neural network is an array of

interconnected nodes that pass information between different layers to find connections and derive results from data. The quality of the data and the applied algorithms for their processing affects the quality of the solution (forecast) offered by the AI.

The main components of AI technologies are folloing:

Learning - AI's machine learning feature allows machines to learn from data, identify patterns, and make decisions without explicit programming.

Reasoning - The ability to reason is critical to AI because it allows computers to mimic the human brain. AI can make inferences based on commands given to it or other available information to form hypotheses or develop strategies to solve a problem.

Problem Solving - AI's ability to solve problems is based on manipulating data through trial and error. It involves the use of algorithms to explore different possible paths to find the most optimal solution to complex problems.

Language Processing – AI uses natural language processing – or NLP – to analyze human language data in a way that is meaningful to computers, i.e. the ability of computers to understand, interpret and produce human language through text analysis, sentiment analysis and machine translation.

Perception – AI scans the environment using sensors such as temperature sensors and cameras, called computer vision, which allows machines to interpret and understand visual data. It is used for image recognition, face recognition and object detection [3].

There are two categories of AI. Weak (narrow) AI represents systems that are designed to solve specific tasks with clearly defined parameters. As a rule, such systems work within a limited range of knowledge and have no possibility for general intelligence. For example, Apple's Siri, customer service chatbots, virtual personal assistants, etc. Strong (general) AI aims to develop a system that can solve a wide range of tasks with different skill levels. Such AI systems are able to adapt, learn and

apply knowledge in various fields. For example, autonomous cars, robotics, text understanding and generation like GPT, art, etc.

Analytical data indicate the rapid spread of the use of AI in the world. According to experts, rapid growth of the market of digital technologies with the use of AI is expected (Fig. 1). The global AI-market size was valued at USD 95,60 billion in 2021 and is predicted to reach USD 1847,58 billion by 2030 [4].

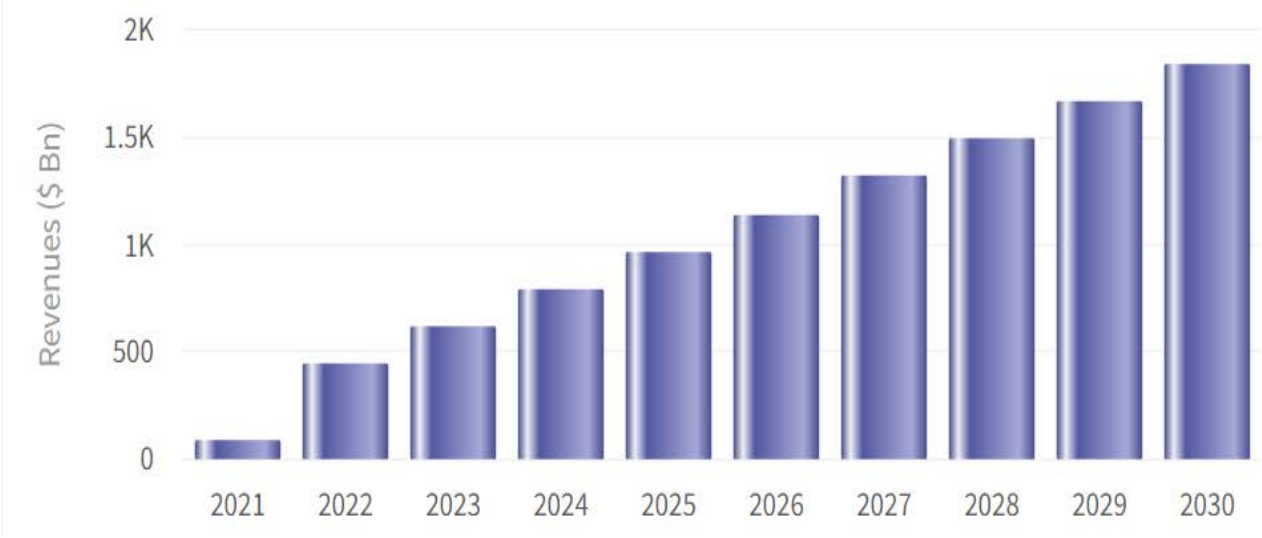

Figure 1. Artificial Intelligence Market Revenue, 2021 – 2030 (USD Bn) [4]

At the same time, Ukraine ranks third among the countries of Eastern Europe in terms of the share of the world AI market [4], which indicates the significant potential of our country in this sector. In general, the most common areas of application of AI in Ukraine are medicine, energy, education, business, public administration, and the military sector. The spread of AI technologies has a number of positive moments and challenges for society. Among the main advantages obtained by the business thanks to the application of this technology should be noted the possibility of forecasting sales markets and forming competitive advantages, automation of business processes, control of the condition of equipment and prompt implementation of preventive measures, minimization of costs, improvement of the quality of products (services), provision of service and support remotely, in any

country in the world, etc. Accordingly, governments and the population of countries receive additional benefits.

Also significant risks and threats associated with the use of AI should be taken into account. The greatest risks include the potential increase in the level of unemployment due to the replacement of human labor by machines when using the latest technologies; growing threats to cyber security, confidentiality and privacy; reliability of solutions proposed by AI; loss of control, etc. From the point of view of innovative enterprises and providers, we note the presence of such problems as the quality of data for training neural networks, the quality of human resources, the availability of financial resources and the appropriate material and technical base; lack of marketing skills to promote innovative solutions on the market. These issues are especially relevant for SMEs.

In addition, the use of AI contributes to the improvement of the management system of administrative processes in the field of intellectual property. In particular, AI makes it possible to facilitate the design of patent documents using image search technology to establish similar and identical designations. Also, the use of AI contributes to the formation of a database of government documents in the field of intellectual property. Thus, we believe that AI technologies have significant potential for further development and require a systematic approach, in particular, taking into account the potential risks and threats they may pose.

To solve these problems and increase the competitiveness of the domestic sector of digital technologies, it is appropriate to pay more attention to local Digital Innovation Hubs. At the same time, it will contribute to the formation of a national innovation ecosystem with the participation of all potential stakeholders.

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