

ECONOMIC IMPACTS OF ARTIFICIAL NEURAL NETWORKS

The achievements of scientific and technological progress are bound to affect all areas of human activity and economic entities. The purpose of this paper is to show the influence of artificial neural networks (ANNs) on the economy.

Neural networks, also known as artificial neural networks or simulated neural networks (SNNs), are a subset of machine learning and underlie deep learning algorithms. Their name and structure are inspired by the human brain, mimicking the way biological neurons transmit signals to each other [1].

The concepts of artificial neuron and artificial neural network appeared in the last century. Such ideas were first expressed by the American scientist Warren McCulloch. And in 1943, under his editorship, an article was published containing a general description of the idea of stimulating the interaction of artificial neurons and a scheme of a device capable of simulating the process of human perception was proposed. At that time, such ideas were among the first of their kind and were therefore innovative in nature. Thanks to what was picked up by the American psychologist and neurophysiologist of Cornell University Frank Rosenblatt, who in 1957 developed and demonstrated the first working trainable artificial neural network with the working name “Perceptron”.

The competitive advantage that companies gain from implementing artificial neural networks is forcing more and more firms and corporations to integrate this innovation into their own manufacturing processes. The proliferation of ANNs is slow, which is why this technology is still used only in some fields. One of such areas is the creation of search queries and the development of search engines. Currently, we can observe a fierce competition between the giant companies such as Microsoft and Google. They were among the first to recognize the advantage of ANNs and due to the huge investments in their development seek to be the primary owners of this technology. Being in close cooperation, Microsoft and OpenAI (a company engaged in the design and development of artificial intelligence) through the introduction of a “smart” assistant in their browser want to arrange the redistribution of consumer demand and as a consequence, increase the number of users and profits. At the same time, Google is also keeping up with its competitor, and is trying to introduce similar technology in order to avoid the plans of Microsoft. And as a result of this technological race, corporations are actively developing this idea, and thus contribute to the improvement of the economic and technological component.

At the current moment, we can state a huge impact of artificial neural networks on various spheres of production, which manifests itself in several directions. Firstly, some of the achievements that have already been reached in the field of artificial neural networks allow a significant increase in the general level of labor productivity due to production automatization. Secondly, the introduction of artificial neural networks leads

to the creation of a new robotic workforce, thereby increasing the overall level of economic resources in the world and their quantity. Thirdly, there is a mass abandonment of routine and monotonous work, which can be done by artificial neural networks, but at the same time many economists state an important fact, that there will not be a widespread abandonment of human resources, but on the contrary their role will increase with the growth of artificial neural networks use, in order to master them and get more profit [2].

Implementation of artificial neural networks capabilities requires significant financial and intellectual costs, due to which there are certain barriers for active development of this technology in the Republic of Belarus at the moment. An example of which is the absence of significant available capital for large-scale financing of such domestic developments and lack of full-time specialists engaged in creation of artificial neural networks in the country. Nevertheless, the Republic of Belarus still has an opportunity to implement this innovation. Certain firms have opportunities to actively use artificial neural networks for basic operations that do not require large financial expenses, such as data processing and modeling of market behavior strategies. Such usage of this technology could allow small enterprises in the Republic of Belarus to make a profit and develop its own production process.

In general, the importance of artificial neural networks in today's reality cannot be denied. It is an advanced technology that can have a significant impact on the activities of huge companies, change the distribution of the workforce by making it more automated, and define new opportunities for many economic actors. Time will make us accept the importance of this innovation and use it in our lives to match and keep pace with global civilization.

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