Industry 4.0: Development and Use of Neural Network Technologies in the Modern World Robotics*

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Abstract

In recent years, the development of the world economic system has received a powerful impetus associated with the massive introduction and use of innovative digital technologies in all economic sectors. The implementation of information and communication technologies led to a large-scale digital transformation of the global economy, which resulted in a new innovative direction - the digital economy, based on the development and application of the most innovative information technologies. Recently, one of the promising areas in the field of digital technologies is artificial intelligence, which has been widely used in various economic fields in industry, the financial sector, in public administration, healthcare and many others. Using artificial intelligence technologies should ensure the creation of a "smart economy" that can adapt to the needs of each individual. The basis of the "smart economy" should be "smart manufacturing", so Industry 4.0 is one of the main directions in the digital economy, one of the main components of which is robotics. Today, the main direction in this area is the creation of robots with artificial intelligence, capable of ensuring the creation of "smart manufacturing". The main types and directions in the development of artificial intelligence technologies at the present stage are considered in this study, its capabilities are analyzed from the standpoint of increasing the economic efficiency of the development of certain sectors of economic development. The global market for neural network technologies is studied in this article, its main financial and quantitative indicators that determine the market size are assessed, and both the artificial intelligence technologies and related applications created on its basis, growth rates are analyzed, key players are defined. Besides, key aspects of the development and application of artificial intelligence technologies in robotics were considered in this study, the main parameters of the global market for robots with artificial intelligence were evaluated, and the main areas of their application in the economy were analyzed. Based on a complex analysis of the development and use of artificial intelligence technologies in the field of robotics, further prospects and directions for their development in this segment are determined.

Keywords: Information Technology Management, Digital Economy, Industry 4.0, Innovation, Intelligent Robotics, Neural Network Technologies, World Market, Efficiency, Development Prospects.