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# THE ARTIFICIAL INTELLIGENCE AND ITS STRATEGIC ROLE IN THE SUPPLY CHAIN MANAGEMENT

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*The article is devoted to artificial intelligence as a promising direction in the development of supply chain management; the leading role of artificial intelligence in the strategic development of the rocket and space and aviation industries, as well as in space exploration, has been revealed.*

*Keywords: artificial intelligence, supply chain management, rocket and space industry, aviation technology, space exploration.*

# ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ И ЕГО СТРАТЕГИЧЕСКАЯ РОЛЬ В УПРАВЛЕНИИ ЦЕПЯМИ ПОСТАВОК

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*Статья посвящена искусственному интеллекту как перспективному направлению развития управления цепями поставок; выявлена ведущая роль искусственного интеллекта в стратегическом развитии ракетно-космической и авиационной промышленности, а также в освоении космоса.*

*Ключевые слова: искусственный интеллект, управление цепями поставок, ракетно-космическая отрасль, авиационная техника, освоение космоса.*

**Introduction.** In modern conditions of digitalization of the economy, the artificial intelligence is the most important area for ensuring the sustainable development of the rocket and space industry. The reliable design, production and operation of aircraft, as well as the management of space navigation, will be provided through the introduction of artificial intelligence as an electronic component base of space systems. In addition, the control over the testing of rocket and space technology and the reliable operation of aviation technology are obvious areas of application for artificial intelligence. Consequently, the artificial intelligence is a reliable tool for increasing the efficiency of supply chain management, the functioning of the rocket, space and aviation industries and increasing their competitiveness, especially in today's conditions of redivision of the world.

**Main part.** The artificial intelligence should be understood as a vast field of computer science dealing with the creation of intelligent machines capable of performing functions and solving tasks that require human intelligence [1].

For a more correct definition of artificial intelligence, there are four types of approaches – think human, think rationally, act human and act rationally.

The artificial intelligence allows machines to replicate the capabilities of the human mind. From the development of drones to the spread of smart assistants, the artificial intelligence is becoming an increasingly important part of our daily lives. As a result, many high-tech companies in various industries are showing particular interest and investment in the artificial intelligence technologies.

The practice of managing artificial intelligence allows it to be divided into the following four types, depending on the degree of complexity of the tasks to be solved: reactive machines, limited memory, theory of mind and self-awareness [1].

A reactive machine is able to perceive the world around them and react to it, performing limited tasks. She follows the most basic principles of the artificial intelligence and is only able to use her intelligence to perceive and respond to the world around her.

A limited memory provides the ability to store past data to inform forecasts about what might happen in the future. A memory-limited artificial intelligence can store previous data and forecasts while gathering information and weighing potential decisions, looking into the past for clues about what might happen next. A memory-limited artificial intelligence is more complex and provides more options than reactive machine artificial intelligence.

The theory of mind is the ability to make decisions based on one's perception of how others feel and make decisions. The theory of mind concept is based on the psychological premise of understanding that other living beings have thoughts and emotions that influence human behavior.

The self-awareness is considered as the ability to operate with human consciousness and understand one's own existence. Once the theory of mind can be established, somewhere far in the future of artificial intelligence, the last step for artificial intelligence will be self-awareness. This type of artificial intelligence has human-level consciousness and understands its own existence in the world, as well as the presence and emotional state of others.

At the same time, the artificial intelligence, as a progressive form of logistics development, plays a strategic role in the supply chains management and increasing their competitiveness, especially in today's global competition.

The strategically important role of the artificial intelligence in supply chain management is obvious. The introduction of the artificial intelligence in logistics is a vital condition for improving the efficiency of managing, mainly, international supply chains and ensuring the competitiveness of business entities. The artificial intelligence in supply chain management is the next step in the digitalization of logistics with its potential for full automation and achieving a significant effect in improving the efficiency of managing logistic business processes with minimal errors and risk situations.

The artificial intelligence penetrates into the production and economic activities of business entities, thanks to the introduction of modern technologies and devices. That is why there is now a gradual investment in the artificial intelligence to improve the functions of logistics business processes and supply chain management of enterprises.

The artificial intelligence especially manifests itself in such areas of supply chain management as supply chain planning, manufacturing management, supply chain business process optimization, international supply chain management, procurement management, warehouse management, transport management, etc. [2].

When supply chain planning, the artificial intelligence is created by machines that act in a similar way to the human mind, i.e. with free thinking. When a machine makes its own decisions based on the historical data it has collected, it can achieve its goal. This process is known – this is artificial intelligence. Artificial intelligence here can be attributed to the areas of robotics, programming, image recognition, transport, etc. In supply chain planning, artificial intelligence is divided into extension and automation. When expanding, the artificial intelligence helps professionals with day-to-day tasks without having full control over the outcome. The extension contributes to minimizing errors that occur due to the human factor. With automation, the artificial intelligence works completely independently in any area without human intervention. Robots that perform key technological operations in manufacturing plants are an example of automation.

When manufacturing management, in order to increase the competitiveness of products, it is necessary to strive to reduce the cost of production business processes and save time on them. This is where the artificial intelligence makes the supply chain more productive and profitable for business. Many enterprises use artificial intelligence to optimize manufacturing and other business processes and manage customer expectations. For example, they send automated messages to customers to inform them about the tracking of a shipment. This allows you to manage their expectations and at the same time increases the productivity of the enterprise.

The artificial intelligence can adapt to changing scenarios and manage all supply chain business processes. Using historical data and trends, the artificial intelligence can simplify every supply chain business process, from demand to inventory, to meet and satisfy market needs. With minimal human intervention,

saving time and reducing errors, the artificial intelligence provides enterprises with many benefits. In addition, since artificial intelligence has extensive memory capabilities, it can learn from past mistakes and adapt to changes in the external environment to optimize supply chain business processes so that mistakes are minimized in the future.

Planning, organizing, optimizing and forecasting the demand for an enterprise's products is a complex task in the international supply chain management. The artificial intelligence is essential here for identifying and predicting problems and finding possible ways to successfully solve them. The international supply chain managers need to process more data, as this is such a difficult task that only the artificial intelligence intervention can help solve it with minimal errors. Failure to prepare for an effective or efficient response can lead to disruptions in international supply chains.

The artificial intelligence provides automation and justification of additions that help simplify business processes on the procurement management of necessary inventory items in supply chains.

These additions may include communication with suppliers during trivial conversations, placement of applications for orders, study of questions about the functions of procurement and answers to them, receiving, filing and documenting invoices and payments, etc.

The artificial intelligence can use algorithms and data flows to predict various business processes in supply chains. Thanks to the artificial intelligence, this endless cycle of predictive data flows is improving itself, which can change the warehouse management as part of supply chain management for the better.

The artificial intelligence can be used not only for the internal data processing aspects of the supply chain management, but it can also be used to improve the efficiency of the transport management business processes in the direction of optimizing its work. We are talking mainly about drones, which are a clear example of the use of the artificial intelligence and give impressive results. If drone technology is fully implemented, it will stimulate the management of transport and shipments of goods in supply chains.

Therefore, only a reasonable approach to the use of the artificial intelligence in the above areas of supply chain management can lead to the desired effect.

**Conclusion.** Only a reasonable approach to the introduction of the artificial intelligence in logistics and supply chain management will increase its lead in ensuring sustainable strategic development. Such knowledge-intensive areas of the economy as the design, production and operation of rocket, space and aviation technology, as well as space exploration, will always be pioneers in the development of the artificial intelligence.

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