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THE USE OF ARTIFICIAL INTELLIGENCE IN CUSTOMS

Research Field:

Innovative Technologies in International Trade

Digitization gives a lot of opportunities for the usage of information technologies in the field of customs. To fully develop trade and foreign economic activity customs authorities should use modern technologies as much as possible. Nowadays the main information systems of customs authorities include the Unified Automated Information System of Customs Authorities and the Electronic Declaration Center. It should be noted that there are other systems which help to process customs duties, but all that can be considered as not enough, as the world is developing rapidly if it concerns digitization.

It is possible to suggest that digital technologies will allow introducing artificial intelligence into many functional programs of customs authorities. Artificial intelligence is a complex of technological solutions that allows to simulate human cognitive functions (including self-learning and problem-solving without a pre-determined algorithm) and to obtain results comparable at least to those of the human intellectual activity when performing specific tasks.¹ To solve the tasks, artificial intelligence must have the following capabilities: learning, reasoning, problem-solving or questioning, perception, understanding a language. The decision-making process requires studying past experiences and self-correction so that to make certain decisions and to come to right conclusions.²

It is important to distinguish between an automated system and artificial intelligence:

An automated system	Artificial intelligence
1. An automated system works independently, based on the pre-established and self-reproducing program to perform specific tasks.	1. Artificial intelligence makes a decision based on the previous experience and information obtained.
2. An automated system is designed to solve	2. Artificial intelligence is designed to solve

¹ On the development of artificial intelligence in the Russian Federation: Decree of the President of the Russian Federation, October 10, 2019, No. 490 // ConsultantPlus.

² Transformation of electronic customs into intellectual / V. A. Filchakova // Customs regulation. Customs control. – 2022. – Vol. 694, No. 9. – pp. 20-26.

repetitive tasks based on a certain algorithm.	all tasks, including non-standard situations.
3. The system helps experts analyze situations and come to a certain conclusion.	

Among the main disadvantage of an automated system one can name its unpreparedness for emergency situations and tasks. It can lead to the suspension of customs operations. While artificial intelligence will analyze the situation, consider several options and come to a certain conclusion. That is why artificial intelligence can become a vital tool of effective work at customs houses when solving professional tasks.

Let us consider what tasks the use of artificial intelligence helps to perform:

- the reduction of time and financial costs;
- the separation of documentary and factual control;
- the standardization of the approaches for the consideration of customs declarations and release of goods;
- the exclusion of direct contact between the declarant and customs officials (which in its turn will reduce the risk of possible corruption);
- the effective interaction between customs and business;
- the processing of large amounts of information;
- the increase in the efficiency of customs control.

Based on the functional capabilities of artificial intelligence, the following types of systems can be distinguished:

- 1) the artificial intelligence program for the purpose of classifying goods in accordance with the Harmonized System of Description and Coding of Goods (HS);
- 2) the artificial intelligence program for conducting customs control using technical means of customs control;
- 3) the artificial intelligence program for conducting weight and dimension control;
- 4) the artificial intelligence program for conducting radiation control;
- 5) the artificial intelligence program for automatic release of declarations on goods.

It is high time to have a closer look at the action mechanism by artificial intelligence for conducting customs control activities using technical means of customs control. The checkpoint will be equipped with the unified information system that will receive information during radiation control, weight and dimension control, and customs control using the Electronic Declaration Center and possibly other types of control processes which must be carried out on these goods. Then, artificial intelligence processes the information and makes a decision on releasing the goods or conducting customs inspection with the help of customs officials. This

mechanism involves equipping checkpoints with flow-through Electronic Declaration Centers that will scan all incoming vehicles without disembarking the driver of the vehicle. Artificial intelligence will analyze all images taken by the Electronic Declaration Center, and only those images that show problematic situations or risks will be sent to customs officials. Currently, the procedure of scanning one vehicle takes about 10 minutes. When using artificial intelligence, the time for analyzing the image will be reduced, and the effectiveness of their analysis will increase.

It is worth writing about the development of an expert group called BACUDA programs for using artificial intelligence to classify goods in accordance with the Harmonized System of Description and Coding of Goods (HS). The model uses accumulated information to recommend product codes in accordance with the HS depending on the commercial description of the goods. That mechanism uses difficulties in interpreting product names and descriptions in the HS.

The model uses modern language processing technology based on the Doc2Vec artificial neural network. This technology allows the model to recognize semantic relationships between words in product descriptions and HS codes, recommend HS codes for new product descriptions or those that are not included in the product nomenclature. The technology is optimized for declared data since it includes various methods of preprocessing information.¹

The main idea of the model is to study pairs of product codes and their commercial description declared by an individual. Based on the experience gained in determining product codes, artificial intelligence recommends several HS codes when creating a new product description. Thus, when entering product descriptions, the technology recommends an HS code that has the most similar description. This model showed the highest results in determining product codes for complex products in groups 84, 85, and 87 of the HS.

Summing up, the introduction of artificial intelligence into the activities of customs authorities will help to develop effective functioning of customs. To efficiently apply artificial intelligence in customs, one needs significant changes in the organizational-functional structure as well as modernization and improvement of the material and technical base of customs authorities.

¹ Artificial intelligence – for the purposes of classification of goods / P.Pavlyukevich // Customs Bulletin. – 2022. – Vol. 314, No. 8. – pp.68-69.