

The future of the railway industry

Analyzing the world's largest exhibition of transport technologies "Innotrans 2024" and the general situation on the rail transportation market in Ukraine and the EU, certain conclusions can be drawn about the further development of the railway industry.

The greatest attention at Innotrans 2024 was attracted by artificial intelligence (hereinafter AI), which is used to perform the functions of controlling wagons, their technical condition, and the condition of their components (wheel sets, bogies) in railway infrastructure monitoring and management systems, as well as for collection, analysis and data processing. That is, the world is gradually moving towards reducing the influence of the human factor on railways and automating processes, which will allow to speed up the execution of certain operations and tasks, minimize possible errors in work, increase productivity and reduce current costs. However, on the other hand, it requires significant investments at the stage of implementation, and also complete dependence on machines contributes to the emergence of certain risks, the consequences of which can be very severe. These can be both potential hacker attacks and ordinary work failures, the occasional cases of which we can observe from time to time in various EU countries, leading to great destruction and human casualties. Therefore, in my opinion, it is necessary to maintain a certain balance between the introduction of technical innovations (where appropriate) and additional human control over their use together with automatic safeguards.

Examples of companies implementing artificial intelligence: Bitcomm Technologies Pvt. Ltd (India), Shenyang Quick High Robot Co. Ltd. (China), Cyient GmbH (Germany), KONUX GmbH (Germany), voestalpine Railway Systems GmbH (Austria), Kodify Limited (China) and others.

We also see that the EU industry has attracted the interest of countries from all over the world. There were a lot of companies from India, China, Turkey at the exhibition, and new participants from Africa and Asia (Morocco, Malaysia, Indonesia and the Republic of South Africa) were added.

There is quite strong competition in the field of railcar construction, more and more companies offer the manufacture of rolling stock to the customer's order, depending on the track width, type of railcar and infrastructure. Since there is currently a surplus of wagons in the EU and a large part of them are idle, therefore, in order to gain a competitive advantage, many manufacturers have their own design base and work on improving the design features of their products, namely: reducing the wagon's tare (and proportionally increasing the carrying capacity), the use of steel of greater strength and wear resistance, the possibility of transporting as large a range of goods as possible, that is, rolling stock becomes more versatile.

Examples of companies with their own design base that produce RS to order: TATRAVAGÓNKA as (Slovakia), TransANT GmbH (Austria), TURASASŞ (Turkey), Gok rail (Turkey), Jiangsu Railteco Equipment Co., Ltd. (China).

Nevertheless, most of the cargo in the EU is transported by road, because it is more cost-effective, but the result is very large traffic jams and environmental pollution with exhaust gases, especially since the number of cars on the roads has reached its maximum and cannot be increased anymore. Therefore, the logical consequence is the need for a major European railway reform. A program of measures to reduce CO₂ emissions and increase the share of cargo transportation by rail transport is already in place across the EU.

In Europe, there are also difficulties in the construction of new factories, workshops, warehouses for storing materials or raw materials for production, since all this requires cutting down forest plantations to free the territory. An alternative is the "Just in time" system, which requires the delivery of batches of components, raw materials or materials on time and precisely according to the schedule due to good logistics, which can be achieved precisely thanks to rail transport.

In connection with the fact that Ukraine is on its way to joining the EU, there are questions regarding the unification of our railway industry and bringing it into line with EU norms and requirements, which must be dealt with now. In particular, there are the following problems: inconsistency in legislation, inconsistency in the numbering system of wagons (change of 8-digit numbers to 12-digit numbers), fragmented power system (alternating sections with direct and alternating current), different track width and many other problems. Therefore, the issue of changing the Law on Railway Transport and the unification of the Ukrainian railway industry as a whole is urgent.