

Digital Breakthrough in Metallurgy: How Metinvest Digital is Training Machines to Control Metal Quality

At the “The Great Digital Transformation: Dialogues about the Future” conference organised by the publication NV in Kyiv, Maksym Balanyuk, head of the R&D centre at Metinvest Digital, explained how Metinvest Group is implementing artificial intelligence (AI) tools to automate processes and control product quality in the production process.



The event brought together 23 speakers, including Mykhailo Fedorov, Deputy Prime Minister for Innovation, Education, Science and Technology Development and Minister of Digital Transformation, along with senior managers from large companies, representatives of the public sector and IT experts. They discussed how AI and digital technology are helping Ukrainian companies not only to survive in the current environment, but also to gain competitive advantages during wartime.

Balanyuk participated in the “AI: Threat or Magic Pill?” panel. The discussion also featured Artem Borodatyuk, founder of Netpeak Group, and Serhiy Strelkovskiy, an officer from the unmanned surface vehicle training group.

According to the head of the R&D centre at Metinvest Digital, one of the main barriers to AI implementation is the lack of high-quality, structured data along with inflated expectations of the technology that do not always match its real capabilities.

Balanyuk said: “Technology is only part of the broader challenge. The real barriers lie in cybersecurity, regulation and compliance with new standards, particularly European ones. But one thing is clear: if you are not yet working with AI, it is time to start, because without it, your competitiveness will rapidly decline.”

At the same time, the war is bringing new challenges that require creative thinking. He noted: “Currently, we are actively implementing digital solutions, including those using AI elements, that are already helping to address specific business tasks. Simultaneously, we are working proactively by analysing potential future issues, such as workforce size reductions, security concerns and more.”

One of the products implemented by Metinvest Digital is a computer vision-based solution for real-time quality control of semi-finished products. He added: “For us, this is truly a breakthrough. This solution has opened up new opportunities for the development of other projects.”



The system automatically identifies defects during slab production: it indicates to the operator where and what defect has been found, helping to ensure that the material is cut correctly.

The solution is already operational at Metinvest's largest enterprise. The system is currently being improved by enhancing recognition accuracy, processing speed and depth of analytics, right down to the causes of defects at earlier stages.

A similar solution is being developed to identify defects in other equipment, where products move at a speed of 5 metres per second. Balanyuk stated: "We expect to complete the first version by the end of August. And then pilot industrial testing will begin."

The next stage, following in-depth analysis of defects during the production of semi-finished products, is integration with physical robotic systems to fully automate the process.

In addition, Metinvest Digital has tested language models during the production of cast products, such as excavator buckets, to automate the development of technical processes, from processing blueprints to selecting tools. Balanyuk asserted: "Although the current results only partly address the issue, the potential is already clear. This technology could significantly simplify routine operations, handle technical documentation and accelerate preparation for production."

The head of the R&D centre also noted that Metinvest Digital has begun cooperating with other large businesses, including market leaders in pharmaceuticals, agriculture, retail and even furniture manufacturing.

He said: "This is extremely valuable, as companies with strong internal IT departments understand the real challenges and can share their experience on how to avoid mistakes. Such open interaction is a great case study for Ukrainian businesses: it accelerates the adoption of proven solutions and enables more effective product development. For example, following one of these sessions, we changed our approach to our own product, and it became better."