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Stud. D.I. Shostak
Scientific supervisor lecturer, V.U. Dokurno
(Intercultural Communication and Technical Translation Department, BSTU)

DIGITAL TRANSFORMATION IN THE REPUBLIC OF BELARUS: MODERN AUTOMATION TECHNOLOGIES IN INDUSTRY AND LOGISTICS

The Republic of Belarus, despite its limited resources, demonstrates impressive success in the field of AI technologies. For example, the introduction of CISZ (Centralized Healthcare Information System) has reduced patient data processing time by 40%. The purpose of the study is to assess the impact of AI on key sectors of the Belarusian economy like Industry and logistics and predict the socio-economic consequences. Let’s move on to something particular.

The Minsk Tractor Works (MTW) has implemented an AI-based predictive equipment maintenance system, which has reduced downtime by 25%. According to the Ministry of Industry and Trade, 68% of large enterprises use AI for quality control.

ASKUE Project (Innotech Solutions): The main activity of Innotech Solutions is automation in the energy sector of the Republic of Belarus. The company's achievements include the development and implementation of automated systems for monitoring and metering of electric power (ASCE), automated process control systems (APCs), and various automation systems for energy supply Organization. Automated electricity metering has reduced grid losses by 15%.

A joint project of the National Academy of Sciences of Belarus and the Institute of Bioorganic Chemistry: AI has reduced the development time of new drugs [1]. First of all, the methods of computer molecular modeling are used. Usually, out of 130,000 generated compounds, about 10 of the best are identified, which are used in further development. AI algorithms predict biological activity and safety of substances.

The "Graphist" system [2]. Let's talk about it in more detail. In 2021, the Belarusian Railway launched the Graphist system, which has become the flagship project of the digital transformation of the industry. This is the first platform in the CIS that uses neural network algorithms for cargo transportation planning. It offers integration with existing infrastructure without the need for large-scale modernization. It shows a real reduction in operating costs. The algorithms analyze historical travel data, which contains more than 15 parameters, and based on this, predicts cargo traffic with an accuracy of 89%.

Productivity in Belarus' industrial sector rose by 7.7% in 2023, as reported by Belstat [3]. These efficiency gains are complemented by measurable

cost reductions, including $1.6 million in annual savings from optimized processes enabled by Graphista's technologies.

According to forecasts, by 2030 automation will affect 23% of manufacturing jobs. In 2022, it was recorded 127 hacker attacks on AI systems.

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Master’s stud. A.V. Korpus
Scientific supervisor lecturer, V.U. Dokurno
(Intercultural Communication and Technical Translation Department, BSTU)

STUDY OF THE STRUCTURE OF RUBBERS WITH ROSIN-CONTAINING AND NANOSCALE COMPONENTS

In the rubber industry there are a large number of products with complex construction. In such products it is important to ensure sufficient adhesion. One of the ways to realise these requirements is the use of adhesion enhancers. Rosin and products based on it are used as adhesion enhancers [1]. The introduction of rosin into rubber compounds reduces their viscosity, significantly increases adhesion and, due to its acidic nature, slows down sub-vulcanisation. In the presence of rosin, dispersion of powdered ingredients is improved and high elastic and dynamic properties of rubbers are maintained [2].

However, every year, the demand for rosin increases significantly, resulting in its shortage. In this regard, the practical use of new and effective rosin substitutes in elastomeric materials is an actual direction of research and development work.

Nanoscale additives are increasingly used in the rubber industry. Due to their small size and large specific surface area, they are able to influence the