DIGITIZATION OF RAIL TRANSPORT IN UZBEKISTAN

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The most important task of the engineering and technology age is the development of the transport sector. The use of information systems in transport (especially on rail) makes it possible to optimize resources, investments, and costs and, accordingly, increase profits. New technologies in the freight transport market increase the efficiency of the railways and their attractiveness to customers, which ensures a high level of competitiveness in the market. The introduction of artificial intelligence in infrastructure facilities and rolling stock will help to solve complex traffic management optimization problems in railway complexes. Therefore, the existence of rail transport is unthinkable without the digitization of the transport process.

To achieve more efficient, reliable, and safe control systems compared to the existing ones, it is necessary to focus on maximum automation of technological processes and the influence of the human factor in the operator's transition to the role of an observer and in the acquisition of digital models of objects in technical systems. The digitization of data, i.e. the digital representation of information, significantly increases the functional reliability of all connections that ensure the implementation of the train timetable. Digital data effectively organizes the process of accumulation and storage, and the automatic data processing mode opens ways to achieve a new quality of systems. However, it is becoming clear that development without integration leads to a decrease in the effectiveness of digitization. Only a joint development based on digital technologies can bring about a synergy effect that the Uzbek railways and the entire industry are looking forward to. It cannot be denied that there are advanced means of technical diagnostics and monitoring, automation of data processing and transmission, and decision-making. So far, however, the infrastructure complex and the traction units are being improved in isolation from each other.

Intellectualization and digitization should encompass three basic components of the transport process: organization of transport; Vehicles; technical means of infrastructure. Improving economic management is possible only by creating a single complex with a digital locomotive and digital infrastructure and disposition. Therefore, the digital integration of the interaction of rolling stock and infrastructure with the traffic organization center is one of the core tasks. For example, a locomotive should contain technical means and modules for processing data on the condition of wagons, equipped with sensors for technical diagnostics and monitoring. The transition to universal principles of information processing requires artificial intelligence, which makes it possible to increase the level of automation, especially when implementing

several security functions. This is the future that developers of train control systems around the world are heading towards. A step-by-step solution to the following basic tasks is required to implement the Digital Railway concept:

Development of data traffic between road users, digital infrastructure facilities, and digital locomotive;

Introduction to the principles of self-organizing and self-learning systems for automatic train planning, traffic control, and journey;

take into account the individual characteristics of infrastructure facilities and rolling stock when controlling train traffic;

to increase the degree of integration and interaction of railway infrastructure facilities;

Introduction of digital infrastructure, transport management system and rolling stock to create automatic control systems. The implementation of these initiatives is due to the high cost of implementing these systems. Since the price of a centralized arrow is very high, it is much more reasonable to create a system that will allow a radical reduce the cost of digitizing the base level, while unconditionally meeting the requirements of safety and reliability. Without this, digitization will not bring the necessary efficiency to the activities of Uzbek railways.

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