



“DIGITALIZATION OF LABOR SAFETY IN INDUSTRIAL ENTERPRISES THROUGH IDENTIFICATION AUDIT AND ARTIFICIAL INTELLIGENCE”

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Annotation: The article is devoted to the issues of digitalization in ensuring safe working conditions at industrial enterprises through identification audits and the use of artificial intelligence. The study examines innovative approaches to improving labor safety systems, early detection of hazards, reducing the impact of the human factor, and systematically managing safety in the production environment.

The work develops algorithms for the automatic detection and classification of hazard sources by integrating artificial intelligence elements into the identification audit system. A digital model enabling real-time data collection, processing, and forecasting for assessing labor safety is proposed.

In addition, proposals have been developed for analyzing employees’ behavior, assessing their level of compliance with safety requirements, and forming a safety culture based on behavioral audits. [1] The results of the study can be practically applied in creating a digital and intelligent model for managing safe labor in industrial enterprises.

Keywords: labor safety, industrial enterprises, identification audit, behavioral



audit, digitalization, artificial intelligence, risk management, production safety, intelligent control system, real-time monitoring..

INTRODUCTION: Today, the issue of ensuring labor safety and a healthy working environment in industrial enterprises has significant socio-economic importance. [2] Along with the increasing complexity of production technologies, the widespread introduction of automation and digital control systems, the influence of the human factor on safety is also growing.

According to statistical data, 60–70 percent of workplace accidents and technological failures are related to the human factor. Therefore, the use of artificial intelligence (AI)-based digital systems in managing labor safety not only enables the early detection of risks but also allows their automated management.

Digitalizing identification audit processes (i.e., identifying hazard sources, assessing them, and systematically monitoring) reduces human error and provides the ability to analyze and forecast risks in real time. From this perspective, this topic is situated at the intersection of the concepts of “Digital Economy,” “Industry 4.0,” and “Safe Labor,” and is highly relevant today due to its scientific and practical significance.

Object of the Study: The process of managing labor safety in industrial enterprises, that is, the system of interactions between humans, equipment, and the environment in the production setting.

Subject of the Study: The processes and algorithms for digitalizing identification audit systems to ensure labor safety, as well as methods for their optimization using artificial intelligence.

Relevance of the Topic: Today, the issue of ensuring labor safety and a healthy working environment in industrial enterprises has significant socio-economic importance. Along with the increasing complexity of production



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“Scientific Novelty of the Topic:”

✚ An algorithm for the automatic detection and classification of hazard sources in industrial enterprises is developed by integrating artificial intelligence elements into the identification audit system.

✚ A digital model is proposed that enables real-time data collection, processing, and forecasting for labor safety assessment.

✚ An integrated audit system is developed for monitoring and analyzing employees’ personal safety indicators (e.g., through biometric or geolocation identification).

✚ As a result of digitalization, an intelligent control model is proposed to serve as the basis for automating the decision-making process in labor safety management.

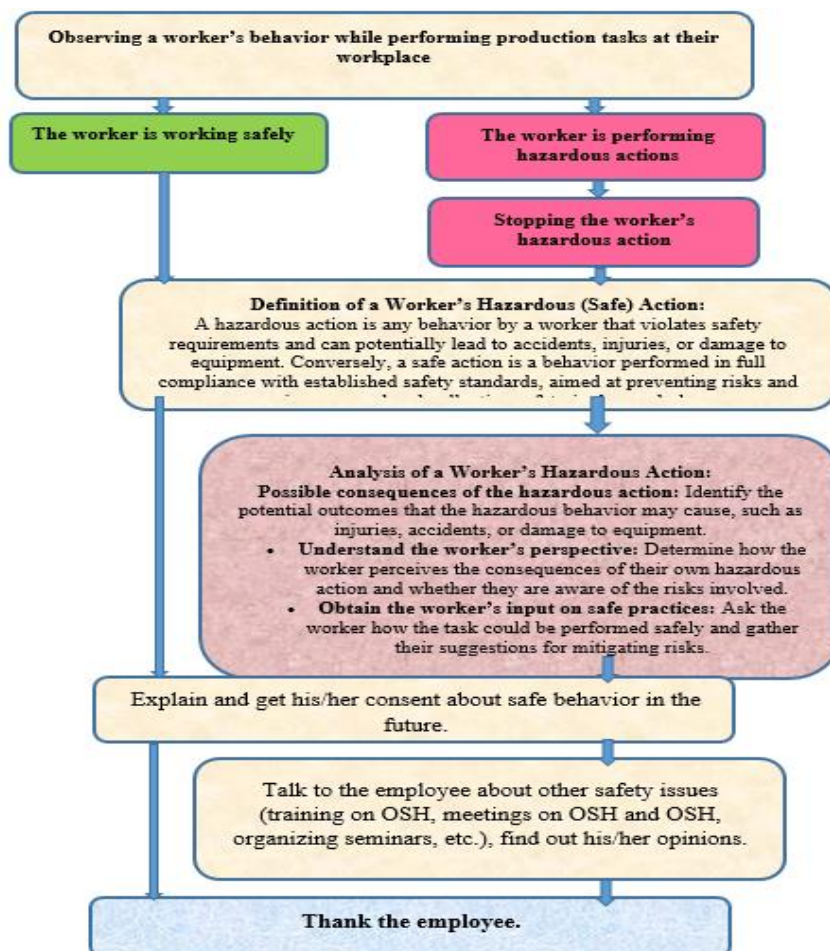
“Justification of the Topic:”The increasing complexity and automation of production processes in industrial sectors introduce new types of hazards.

- The Law of the Republic of Uzbekistan “On Labor Protection,” the “Digital Uzbekistan – 2030” strategy, and the Industry 4.0 programs place special emphasis on digitalizing production and creating a safe working environment.



• Current audit systems are often conducted manually, based on subjective assessments, and do not provide real-time monitoring. Therefore, digitalizing them is a necessary condition for systematic control and prompt management.

• Safe behavior refers to norms, and behavioral audits aim to instill this principle in all employees. In the era of rapid changes in equipment and technologies, their stability and reliability are increased annually, and employees are required to continuously improve their skills. However, mastering new equipment and technologies alone does not necessarily reduce accidents and injuries, and in some cases, employees may fail or refuse to comply with safety requirements.



“Procedure for Conducting a Behavioral Safety Audit”



Another major cause of accidents, disasters, or injuries is when a worker is forced to violate safety requirements due to the production environment. Another reason is when management assigns tasks to a worker that are outside their area of expertise or responsibilities, and the worker lacks sufficient qualifications to perform the task, which can lead to accidents.

Based on the above, it can be concluded that conducting a behavioral audit—i.e., observing, assessing, and analyzing a worker’s actions—is one of the fundamental principles of systematic safety management and serves to prevent accidents.

Practical Significance of the Topic: The research results can be applied in the following areas:

Developing software platforms or AI modules to digitalize labor safety management systems in industrial enterprises.

Creating real-time information dashboards for hazard monitoring for enterprise management.

Increasing objectivity and accuracy in audit processes by reducing human involvement.

Implementing mechanisms for early detection and prevention of emergencies using an automated audit system.

Contributing to the improvement of labor safety policies through the development of a scientifically-based model.

Conclusion: This article highlights that the topic represents one of the most important directions in modern industrial development. Digitalizing safety systems based on identification audits and artificial intelligence not only enhances production efficiency but also plays a significant role as an innovative approach in protecting human life and health.

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