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ARTIFICIAL INTELLIGENCE – A TOOL FOR DEVELOPING THE NATIONAL SOCIAL PROTECTION SYSTEM

The formation of a socially oriented state has become one of the main priorities of modern state social and economic policy. During the expanded government meeting held on February 7, 2024, the Head of State placed special emphasis on the condition of the social sector and the need to «increase the effectiveness and targeting of social assistance, which will help free up resources for targeted support of those in need.» The social assistance and support system in our country is undergoing significant reforms. Modern challenges necessitate institutional transformation in the social sphere.

One of the factors contributing to the harmonization of social and labor relations is artificial intelligence (AI), which enables transparency and accessibility of social services for citizens, especially for socially vulnerable groups. Under the auspices of the Ministry, a digital information ecosystem for social and labor relations is being progressively developed, integrating a vast array of data.

> *«It is extremely important to continue the digitalization of the economy and ensure the widespread use of artificial intelligence technologies»*
>
> *K.J. Tokayev,*
> *President of the Republic of Kazakhstan*
> Extended meeting of the Government on February 7, 2024

At the direction of the Head of State, «each ministry must have a **digital transformation roadmap** for its sector, providing a **comprehensive vision** of the technologies that will be widely implemented in the areas under their supervision over the next five years. It is necessary to create a **foundational institutional environment for the development of artificial intelligence**, which can become a driving force for economic progress and the adoption of innovations».

Modern challenges define the main trends of global development and test the readiness of national economic systems for the widespread adoption of AI. The expert community has formed a positive outlook on the impact of technological progress on the global economy. According to Price Waterhouse Coopers (PWC), over 80% of enterprises will be using AI tools, leading to a global GDP increase of 14% by 2030. The McKinsey Global Institute offers its own assessment, predicting that by 2023, 50% of large companies will have implemented a full range of AI technologies. Overall, according to IMF experts, 60% of jobs will be based on the use of AI. Evaluations of AI growth potential from ongoing research allow for forecasts of an average annual growth rate in the AI market of 37%.
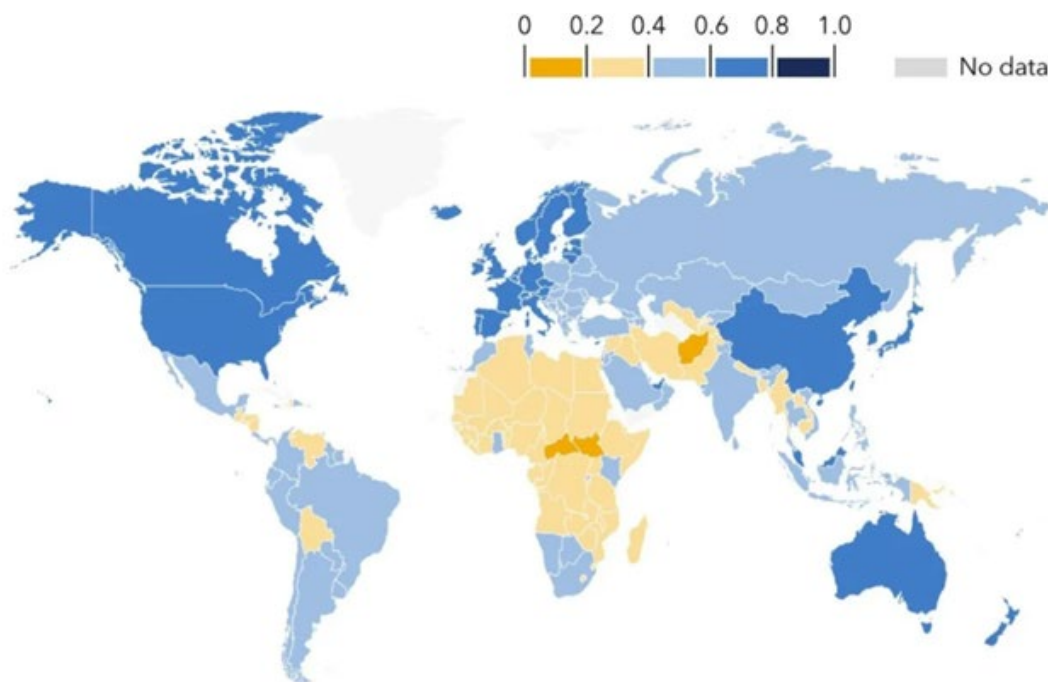
Figure – Global AI Readiness Index.
(according to the International Monetary Fund (IMF), April 2024)

Kazakhstan is aligned with the main digital transformation trends. AI technologies are being actively applied in the sphere of social and labor relations. The developed Digital Family Map (DFM), covering over 6 million families and more than 20 million people, reflects the real state of social well-being in the population and enables the development of forward-looking measures to improve the quality of life.

Digital Family Map

Level of well-being		Number of families	Population size
A (favorable)		247 343	1 093 205
B (satisfactory)		2 549 238	9 00 5099
C (adverse)		1 897 129	6 092 034
D (crisis)		1 304 233	3 205 219
E (emergency)		288 689	714 637
		6 286 632	**20 110 454**

The systematization and accessibility of information on working conditions have been ensured through the creation of the Digital Map of Enterprises (DME). This map is based on the integration of production and social risks of enterprises, analyzed across sectors and regions. The system monitors around 300,000 enterprises, including 12,000 small and medium-sized businesses, across more than 60 financial and economic data points, safety indicators, and other characteristics of labor relations.

The Digital Map of Enterprises integrates information on the terms of employment contracts, social contributions, and payments, providing a comprehensive picture of the socio-economic status of the workforce. In other words, integrating the data from the Digital Map of Enterprises and the Digital Family Map within a unified social and labor relations ecosystem creates a digital platform for monitoring workplaces and gives a more complete understanding of the level of social protection for citizens and their families.

In an online format, general information about the enterprise is available, including key production characteristics, such as assessments and the level of current and potential risks to which workers are exposed at their workplaces. The digitalization process has achieved transparency in the labor sphere,

resulting in a 15% reduction in the number of enterprises with a high level of occupational risk during the implementation period of the Digital Map of Enterprises.

By accumulating a vast array of data, the Digital Map of Enterprises (ЦКП) allows for real-time monitoring of working conditions and the level of social protection for employees. Currently, the digital format displays data on the number of workers employed in hazardous conditions—7% of the 1.6 million enterprises surveyed—as well as those under medical supervision, totaling 8,100 people, and those injured in workplace accidents, numbering 1,800 individuals. In total, labor inspectors have conducted 9,700 inspections.

Digital Ecosystem for Occupational Health and Safety (Digital map of enterprises)

7% workers are employed in hazardous conditions
(out of 6.9 million employees)

172 ths. enterprises have entered into a CAIA
(coverage of 84% of active legal entities)

3,7 million workers are insured against accidents at work
(coverage of 64% of employees)

9,7 ths. inspections were carried out by labor inspectors

The digital platform ensures the coordination between the Digital Map of Enterprises and the Digital Family Map, creating a more accurate representation of the population's socio-economic well-being. This, in turn, establishes objective conditions for making prompt decisions to adjust or eliminate social imbalances. The developing comprehensive digital system for enterprises will allow the full implementation of social guarantees enshrined in the Labor and Social Codes. The systematization of the entire spectrum of social and labor relations fosters an effective social dialogue between employees, employers, and the state, as the primary guarantor of citizens' interests.

The establishment of social dialogue is based on providing access to accurate and reliable statistical information for all stakeholders, including digital data users, about the actual situation in the workplace, current working conditions, and reports of incidents, accidents, and workplace injuries. These innovations are essential for making appropriate managerial decisions aimed at protecting the interests, lives, and health of workers. The harmonization and unification of databases contribute to the synchronization of state, sectoral, and departmental statistical information, creating conditions for effective control and supervision of working conditions and radically improving the quality of life for the working population.

A high level of informatization will create conditions for the rapid processing of information and ensure the necessary transparency in social and labor relations. The application of artificial intelligence in the social and labor sphere enables the synchronization of working conditions under individual employment contracts and collective agreements at enterprises. Information transparency in labor relations becomes a key factor in forming and concluding sectoral agreements that reflect the basic principles and conditions of social protection for workers in departmental enterprises. Thus, individual, collective, and sectoral working conditions for the employed population are integrated and form the basis of the General Agreement between the state, which protects the interests of the country's citizens, trade unions, and employers' associations[1].

The relevance of information is crucial for making timely and well-considered management decisions that meet the interests of all participants in social and production processes. The implementation of artificial intelligence tools in the occupational safety system contributes to the growth of economic efficiency in production.

The developed mobile application, which operates remotely and provides an overview of the current state of working conditions, is synchronized with the enterprise's digital data. This allows for real-time access to up-to-date and accurate information from workplaces. The digital platform enables the monitoring of workplace safety levels, identifying the presence and severity of harmful and hazardous factors in the production environment, detecting the occurrence of emergencies and their consequences, accidents, injuries, poisonings, and obtaining other relevant data. Mobile personal

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[1] *The General agreement*

accounts for stakeholders, employers, and trade union representatives, created within the system, ensure the monitoring of occupational safety conditions, providing real-time data both for each workplace and for the enterprise as a whole.

The digitized information about the state of the production environment is integrated and forms the foundation for the functioning of the regional social barometer, which can promptly signal existing or potential negative phenomena at enterprises. Artificial intelligence analyzes current data from all enterprises incorporated into the system, synthesizes the information, and integrates it into a comprehensive picture of labor risks at the regional, sectoral, and macro levels. The system covers 3,741 large enterprises (33%) and 8,599 medium-sized enterprises (67%).

Distribution of the number of enterprises covered by monitoring by region
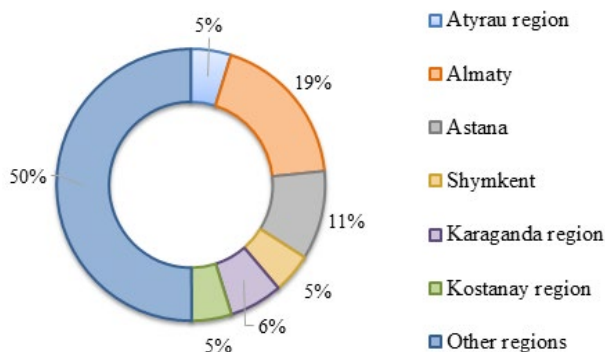
Distribution of the number of enterprises covered by monitoring by industry
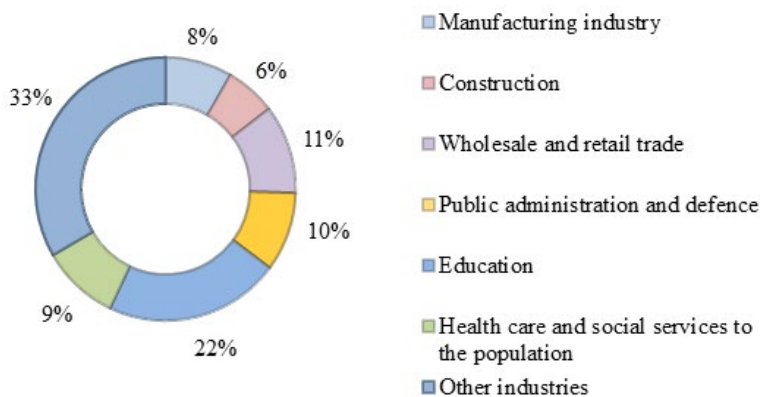
The advantages of implementing artificial intelligence for managing occupational risks are tied to its analytical tools, which enable the development of optimal decision-making options and the forecasting of development scenarios. The results of data processing will be accessible to specialized organizations, management, and workers at enterprises.

Worldwide, there is a significant concern about the relatively high injury rates in industries related to thermal processing technologies. The risks associated with high temperatures and fire hazards are not considered in isolation but are included in the overall risk map of industrial enterprises, with assessments of their risk profiles. The system for digital control and monitoring of industrial risks, integrated with data from the Ministry of Emergency Situations, will ensure that fire inspectors have access to digital data on occupational safety and health.

The transparency in risk profiling of enterprises, along with the processing and analysis of data based on artificial intelligence, will serve as a foundation for developing and making effective decisions regarding the modernization of production. This will aim to reduce the risk of accidents, ensure maximum social protection for workers, prevent production interruptions, and ultimately lead to increased labor productivity and higher profitability.

The digitization of occupational risk assessment and the integration with other enterprise-related databases contribute to maximizing the scope of control and monitoring of business activities, thereby

achieving greater efficiency in occupational safety. Incoming data is integrated and centralized on relevant information resources, making the objective situation at production facilities as transparent as possible. Integrated information across all areas and types of social protection for the population is processed and reflected in analytical form online within the Ministry's unified information system.

The transparency of the comprehensive digital ecosystem of social and labor relations being developed implies the involvement of workers as key stakeholders in the information process. The results of monitoring and assessing hazardous and harmful factors in the production environment at each workplace will also be accessible to the workers themselves. This level of oversight will help reduce injury rates, occupational illnesses, and, ultimately, contribute to improving the quality of life for the working population.

The informatization of labor contract relations is a key component of the broader application of artificial intelligence in the social and labor sphere. AI creates an objective foundation for declaring labor relations, including interactions between employees, employers, and representatives of trade unions and associations, thereby fostering social dialogue among all parties. This will make the process of providing social guarantees more understandable and accessible, ensuring that it is targeted and effective, while the quality of national social protection will strive to meet global standards.

The digitization of contractual relations between employees and employers will lead to transparency and clarity in interactions related to employment, wage payments, and the assignment of social benefits and special payments for hazardous and dangerous working conditions, including pension provisions and other social guarantees and benefits. All payroll operations, while maintaining confidentiality and restricted access, will be integrated into the HR Enbek information system through the use of cloud accounting technologies. This approach will align the financial and economic relationships between employers and employees with international standards.

The informatization of labor relations and the coordination between the platforms of the Ministry of Labor and Social Protection and the Ministry of Finance will simplify and optimize tax administration for businesses and citizens. A public labor contract will recognize citizens as platform-employed, exempting them from filing tax declarations. All official payments and social contributions will be integrated through the internet platform operator. Stakeholders interested in the accuracy and timeliness of payments will be able to track these operations in real-time. Additionally, the Digital Family Map has identified approximately 66,000 enterprises operating within the «shadow economy» sector.

The digital transparency of labor relations will become a driving force for attracting qualified personnel to the industrial regions of the country, including graduates from colleges and specialized universities. The ability to search for internships, professional practice placements, and job opportunities will be a crucial factor in rejuvenating the national technical intelligentsia, particularly among youth who are adept at using digital technologies and mobile applications. Government regulation of workforce availability in labor-deficient regions is also achieved through the planning and monitoring of migration processes. To support this, a dedicated digital platform has been created, enabling real-time access to information on the geographical distribution of the working population.

Digital platform for monitoring migration processes

21,3 ths people — Kandas (consanguine)

9 ths people — according to internal abundance programs

354 ths — registered labor migrants

17,3 ths — registered foreign workers

The control of labor migration identifies both internal and external migration processes, allowing for the collection of structured information across various parameters, including qualification levels, professions, inbound and outbound migration, and other relevant indicators and criteria. The platform is integrated with data on employment contracts, enabling a comprehensive view of these migration dynamics.

To ensure and monitor risk situations at enterprises, each participant in this process must possess the necessary knowledge, skills, and competencies, validated by specific certificates and qualification documents. Therefore, a corresponding system for training, upgrading, and certifying the qualifications of occupational safety and healthspecialists at enterprises and government labor inspectors is essential. For this purpose, an online platform is being developed for training and knowledge assessment, hosted by the Republican Research Institute for occupational safety and health. This platform will also utilize artificial intelligence capabilities to enhance the learning and evaluation process.

The development of a comprehensive information system by the Ministry of Labor and Social Protection is part of the broader task of integrating the information systems of central and local government bodies. This includes the ministries of Emergency Situations, Industry and Construction, Agriculture, Finance, National Economy, Education, Science and Higher Education, as well as regional authorities. Coordinating the activities of these government bodies represents the most immediate opportunity to realize the benefits of artificial intelligence in public administration and planning.

In other words, AI will be integrated into all aspects of the development of social and labor relations. The employment information map, worker monitoring, and the digitalization of migration processes will create a human-centered, adaptive system for managing labor resources. The integration of the Digital Map of Enterprises, digital platforms for social partners and social security, together with the Digital Family Map, will enable the implementation of the principles of a socially-oriented state through transparency, targeted support, and accessibility of state social assistance.

By implementing social innovations based on artificial intelligence, we aim to create a digital ecosystem for social and labor relations. This will establish the foundation for a unified digital system of state planning and management, making a tangible contribution to the development of Digital Kazakhstan. All decisions and actions are focused on fulfilling the directives of the Head of State, aimed at achieving the primary goal of a socially-oriented state – «creating equal opportunities for all citizens and supporting those truly in need», further developing the labor market, enhancing well-being, and improving the quality of life for citizens.