DIGITALIZATION OF THE OCCUPATIONAL HEALTH AND SAFETY SYSTEM

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Annotation. The article considers how a high occupational safety culture is beneficial to employees, employers and the state. It is emphasised that AI can be used to solve the following issues: assessing risks in the workplace; preparing materials for training and briefings; developing questions to test knowledge of a specific regulatory legal act on labour protection; conducting and analyzing audits of the state of labour protection during work and operation of machines, mechanisms, and equipment; developing and updating documents; investigating and analyzing accidents and incidents; planning comprehensive measures for established safety, occupational hygiene, and production environment standards, improving the existing level of labour protection, preventing industrial injuries, occupational diseases, accidents, and fires; planning work of labour protection specialists with task priorities. Various prevention methods have proven effective in preventing accidents at work and in increasing labour productivity. Only through social dialogue can employees, employers and governments come together to address the complex issues surrounding artificial intelligence and employment, and ensure that all work is decent work. However, along with the benefits, digitalization brings new challenges, including issues of ethical data use, protection of personal information, the risk of discrimination due to algorithmic bias, and the blurring of boundaries between work and personal life. New technologies will change the field of occupational health and safety, in particular through task automation, the use of smart tools and safety monitoring systems, the use of augmented and virtual reality, as well as algorithmic work management. The digital transformation of work has led to the evolution of forms of work organization, such as remote work and digital work platforms. Technologies, approaches, and management of the economy of Ukraine and the whole world are changing.

Key words: digitalization, labour rights, employee, occupational health and safety.

1. Introduction.

The digital era presents a conundrum of balancing productivity imperatives with upholding employee rights. In 2022, the International Labour Conference added OSH as a fundamental principle and right at work. Two of the 11 fundamental instruments are OSH-related: the Occupational Safety and Health Convention, 1981 (No. 155), and the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187) [1]. Convention No. 155 establishes a broad framework for OSH, requiring national policies and identifying employer and worker responsibilities in the workplace; while Convention No. 187 complements this approach by emphasizing preventive safety cultures, continuous improvement and national OSH systems. As of 2025, Convention No. 155 has been ratified by 87 countries and Convention No. 187 has been ratified by 73 countries. Both Conventions aim to protect and advance the physical and mental health of workers and to prevent occupational accidents, injuries and diseases.

2. Analysis of scientific publications.

In the legal literature, research on the impact of international standards of labour rights on digitalization on labour relations has already been subjected to scientific analysis by such domestic and foreign scientists as L. Addati, V.M. Andriyev, M. Arena, J.Angelici, M. Bai, M. Belizon, R.T. Blanpain, V. Burak, L.P. Garashchenko, G.R. Carroll, A. Chapman, L. Chang, K. Donovan, R. Epstein, P. Gal, J. Geary, N.D. Getmantseva, J. Golden, L. Gonsalves, T.W. Greer, C. Freudenberg, W. Leidecker,

L.F. Losma, N.B. Kurland, D. McCann, U. Menz, G. Nicoletti, B. Pangert, S.C. Payne, L. Pauls, P.D. Pylypenko, S.M. Prylypko, C.A. Profeta, Ponce Del Castillo A., V.F. Puzyrnyi, P. O'Reilly, B. Rogers, D. Samaan, C. Schuchart, Ya.V. Simutyna, A. Spurgeon, O.M. Rym, M. Vartiainen, S. Verick, S.V. Vyshnovetska, A.M. Yushko and others.

3. The purpose of this article is to research issues of ensuring the right to safe and healthy working conditions in the context of digitalization.

4. Review and discussion.

The contemporary realm of labour law stands as a reflection of society's evolving values, dynamics, and the intricate interplay between employers and employees [2]. In the wake of profound societal changes and technological advancements, the landscape governing employee rights and organizational duties has witnessed a remarkable transformation [3].

Striking the right balance between flexibility and protection, acknowledging the diverse needs of the workforce, and addressing issues of equality and well-being are central to the development of modern labour laws [4] that foster a fair and sustainable work environment.

AI has the potential to reshape the work environment of many people, by changing the content and design of their jobs, the way they interact with each other and with machines, and how work effort and productivity are monitored. Deployment of AI-enabled technologies in the workplace is still at an early stage, and at this moment, it is an open question whether AI will improve or worsen the work environment overall, and how this might differ across different types of AI [5], different employees and different modes of implementation.

Director-General of the ILO Gilbert F. Houngbo. If you prefer a positive surge of intellectual attention to job creation, you can always avoid potential problems in the labour market. Based on this, the ILO, the CEO thought that educational intelligence could be a pure positive factor of interest. «While jobs are being drawn in, a large number of new jobs can be created. We expect that the spill between the destroyed and created works will be in favour of the remaining ones», — he explained [6].

The ILO's normative framework — rooted in the Declaration of Philadelphia and the Fundamental Principles and Rights at Work — provides a well-established ethical and legal foundation for understanding rights in the workplace. Yet these principles are largely absent from AI ethics frameworks. This gap leaves issues, such as algorithmic management, worker surveillance, recruiting or automation-related displacement, without a clear ethical anchor. Closing this gap would require deliberate efforts to integrate labour rights into the global AI ethics debate [7]. Linking AI ethics with ILS could provide a concrete normative reference for national policies and corporate accountability mechanisms.

From an ILO perspective, the Decent Work Agenda remains key for assessing both the benefits and challenges arising from the development and deployment of AI. In practice, responding to the opportunities and challenges posed by AI will involve applying existing policies and regulations, while adapting and developing new strategies and governance frameworks where needed, in line with international labour standards and through social dialogue (e.g., to address the platform economy).

There are three areas we need to look at: first, address the negative impact of AI through redeployment, social protection and active labour market policies (e.g., employment services); second, enhance digital skilling and upskilling to support access to new technologies, along with measures to assist small businesses to overcome the digital divide and take advantage of opportunities; and third, strengthen governance mechanisms to ensure rights are protected in the workplace (e.g., safeguarding against discriminatory algorithms)[8].

The use of AI in occupational safety and health is a revolutionary step, significantly improving safety at enterprises. AI innovations help not just react to hazards, but also prevent them at an early stage, thereby preserving the lives and health of employees and improving enterprise efficiency.

For instance, one of the most common forms of AI used at work nowadays include text editors and autocorrect features, which have evolved from simple mistake detectors to systems using algorithms to identify incorrect language use, offer corrections and even predict text while writing, seemingly reading people's minds. AI is also employed in automated vegetable harvesting in farms, self-driving cars, chatbots used in customer support, systems optimising supply chains, quality control and project management, automated grading in education, and many more. This technology therefore appears in very different forms and can be integrated in many sectors and jobs, each presenting their own possibilities and risks [9].

Robotics in healthcare - improving safety and reducing risks. From diagnostics and disinfection to surgery and patient assistance, robotics plays a decisive role in the protection of medical workers. Robots help protect workers by reducing radiation exposure during MRI scanning and X-rays and minimising the risks of infection by transporting patients, sanitation and autonomous disease testing [10].

Automation and AI systems can eliminate repetitive and routine kinds of clerical or administrative tasks, such as form-filling and processing applications or legal acts.

In customer service, for example, AI-driven chatbots and virtual assistants [11] can handle complex enquiries, reducing the workload for human representatives.

A recent study found that AI could help automate around 84 per cent of repetitive transactions across 400 government services in the UK [12].

In healthcare, interactive robots ease workloads by collecting vital signs and patient data, allowing professionals to focus on complex tasks and patient care.

Smart digital systems are increasingly used in high-risk sectors such as mining, construction, agriculture, textiles and chemicals, where physically demanding work and hazardous conditions heighten accident risks. These technologies provide continuous monitoring, enhancing worker protection and reducing risks [13].

Wearable technologies help mitigate common workplace hazards, including slips, trips, falls and exposure to harmful substances. Devices equipped with accelerometers detect improper posture and movements, alerting workers to unsafe lifting techniques and ergonomic risks [14].

Wearable air quality sensors monitor volatile organic compounds, carbon monoxide and other toxic gases, providing real-time exposure alerts to protect workers from respiratory hazards.

Surveillance in the workplace targets thoughts, feelings and physiology, location and movement, task performance and professional profile and reputation.

At the same time, it is necessary to consider that in the standard workplace, more aspects of employees' lives are made visible to managers through data. Employees' work/non-work boundaries are contested terrain. The surveillance of employees working remotely during the pandemic has intensified, with the accelerated deployment of keystroke, webcam, desktop and email monitoring. Excessive monitoring has negative psycho-social consequences including increased resistance, decreased job satisfaction, increased stress, decreased organisational commitment and increased turnover propensity [15]. The design and application of monitoring, as well as the managerial practices, processes and policies which surround it influence the incidence of these psycho-social risks.

Even when they are not in the office, workers generate a sea of data through their interactions on email, Slack, text and instant messaging platforms, videoconferences, and the still-not-extinct phone call. With the help of AI, this data can be translated into automated, real-time diagnostics that gauge people's health and well-being, their current risk levels, and their likelihood of future risk [16].

Thus, introducing smart digital systems at the workplace can have negative implications if the limitations of these systems are not made clear to the workers. For example, a major chemicals company that has introduced a smart OSH monitoring system that warns forklift drivers when fellow employees are in their proximity stressed how important it is that drivers remain vigilant. This is because the system is based on an infrared camera that uses the reflective properties of employees'

vests in order to warn the forklift drivers. Therefore, in cases where employees might hold a box that covers these reflective properties, the system might not work. Similar examples exist in many smart digital systems [17]. Therefore, it is important to list them in order to ensure that employees tap the full potential of new systems and do not over-rely on them.

On-the-job training can be particularly effective in reducing risks at the workplace, with several manufacturers of the new systems showing through case studies the potential positive effects of such training across a wide range of sectors, including industrial facilities (e.g. warehousing, manufacturing, retail), construction, engineering, health and others. Often, such systems can personalise training depending on the users' characteristics (height, weight, age and others).

Remote work poses challenges for employers in ensuring a safe and healthy working environment. Without direct oversight or regular risk assessments, hazards such as poor ergonomics, environmental risks and inadequate safety measures can go unnoticed, amplifying OSH concerns [18]

According to the article 60-2 of Labour Code of Ukraine when performing remote work, the employee independently chooses his own workplace and shall be personally responsible for ensuring safe and healthy working conditions.

It should be emphasized that AI systems must always remain under human control, even in circumstances where machine learning or similar techniques allow for the AI system to make decisions independently of specific human intervention. Responsibility and accountability for labour rights violations that occur in the development, deployment or use of AI Systems must always lie with a natural or legal person, even in cases where the measure violating labour rights was not directly ordered by a responsible person.

The Cabinet of Ministers at its meeting on October 29 2025 adopted a resolution launching large-scale digitalization of the labor market, the core of which will be the digital system «Obriy». This was reported by the press service of the Ministry of Economy [19]. In «Obriy» it will be possible to: register the status of an unemployed person; apply for unemployment benefits; officially resign in the temporarily occupied territories; receive a grant for training or confirmation of qualifications. The main reasons are outdated business processes, insufficient digitalization of various state services in the field of employment, lack of information for effective analysis and forecasting trends in the labour market, etc.

Today, most administrative services provided by the State Labour Service of Ukraine are available online through convenient digital platforms.

Through this portal, you can submit applications for: issuing a permit to perform high-risk work and for the operation (use) of high-risk machines, mechanisms, equipment; obtaining a license to conduct economic activities for the production of explosive materials for industrial purposes; issuing a certificate for the storage (operation of a storage place) of explosive materials for industrial purposes.

5. Conclusions.

Attention should be drawn to key dimensions that future AI regulation should address: 1) Safeguarding worker privacy and data protection (trade unions at the national level should be able to cooperate with national data protection authorities, provide them with advice about the specific situations of workers, and encourage them to develop guidelines on data protection and privacy at the workplace); 2) Addressing surveillance, tracking and monitoring (in certain contexts, workers interact with technologies, apps, software, tracking devices, social media or devices in vehicles, which monitor their health, biomedical data, communications and interactions with others, as well as their levels of engagement and concentration or their behaviour); 3) Making the purpose of AI algorithms transparent (algorithmic fairness at the workplace implies designing algorithms while taking into account social implications such as: who are the targeted individuals; what are the tradeoffs made in the input of values and variables, like race, gender or socieoeconomic status; or how do algorithms make calculations orpredictions); 4) Ensuring the exercise of the 'right to explanation' for decisions made by algorithms or machine learning models (automated decisions can impact workers negatively: incorrect performance assessment, the allocation of tasks based on the analysis of reputational data,

or profiling. Moreover, algorithmic decisions can have a bias that manifests itself in many forms (in the design, data, infrastructure, or misuse of the model), all influencing the results. In such situations, the 'right to explanation' is essential); 5) Boosting workers' autonomy in human–machine interactions (workers make the final decision, using the input provided by a machine) [20].

Lastly, it will be important to understand that digitalisation is reshaping the world of work, offering new opportunities for OSH: 1) Automation can significantly enhance workplace safety and health by reducing hazardous exposures; 2) Smart OSH tools and monitoring systems improve risk detection and response, through real-time data and predictive analytics; 3) Extended reality technologies revolutionize OSH training and hazard awareness; 4) The growing use of algorithmic management is reshaping workplace dynamics, influencing how tasks are assigned, monitored and evaluated [21]. And the list is not exhaustive. At the same time, the integration of digital technologies can also introduce new physical, organizational and psychosocial risks, which must be carefully assessed and managed. Consequently, only joint efforts of the social partners of Ukraine play a key role in shaping digitalisation policy by participating in decision-making, collective bargaining and leading awareness-raising initiatives to promote a fair and safe introduction of technologies.

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