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PROSPECTS OF APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN TRADE UNION ACTIVITIES

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Abstract:

The article analyzes the prospects for the application of artificial intelligence (AI) technologies in the activities of trade unions. In the conditions of the modern digital economy, trade unions can use AI technologies to effectively communicate with their members, predict labor disputes, conduct intellectual analysis of collective agreements, and scientifically substantiate management decisions. The study identifies the main directions for introducing chatbots, natural language processing, machine learning algorithms, and forecasting models into the activities of trade unions based on international experience. It also examines the risks of introducing AI technologies and measures to eliminate them. The article provides practical recommendations for the digital transformation of trade unions.

Keywords: artificial intelligence, trade unions, digital transformation, chatbots, labor dispute forecasting, collective agreement analysis, machine learning

ENTRANCE

In the context of the rapid development of the digital economy, the transformation of social institutions based on modern technologies is becoming an urgent task. Trade unions are no exception to this process, as they need new approaches to establishing effective communication with members, regulating labor relations, and justifying management decisions.

Although artificial intelligence technologies have been widely implemented in various fields in recent years, their use in trade union activities has not been sufficiently studied. In particular, scientific research on a comprehensive model and performance indicators for the implementation of artificial intelligence in this area is limited.

LITERATURE ANALYSIS

The application of artificial intelligence technologies in various fields has been widely covered in scientific research in recent years. In particular, K. Schwab has substantiated the importance of innovative technologies in transforming the activities of organizations in the context of the digital revolution [2].

S. Russell and P. Norvig have studied in depth the theoretical foundations, algorithms, and practical applications of artificial intelligence, and they evaluate AI as a means of automating decision-making processes [4].

The processes of digitalization in trade union activities are analyzed in the studies of Gottfried and Ziegler, who show that digital technologies increase the effectiveness of communication with members [3]. Similarly, Russell B. in his work emphasizes the need for artificial intelligence and big data (Big Data) in the analysis of labor relations [7].

Research by Smith and Anderson shows the impact of AI on the labor market and the changing role of unions [8]. They argue that AI can be used to predict labor disputes and optimize management decisions.

The application of blockchain technology in labor unions has been widely covered in Tapscott's research, where it is considered a necessary tool for ensuring data transparency and trust [9]. Lee and Lee have analyzed the practical aspects of blockchain-based voting systems [10].

According to the above studies, artificial intelligence and digital technologies are crucial for the effective organization of trade union activities, but comprehensive approaches in this area that are suitable for the conditions of Uzbekistan have not been sufficiently developed.

At the same time, an analysis of existing scientific works shows that the issues of adapting artificial intelligence technologies to the activities of trade unions, especially their integration with complex information systems, have not been sufficiently studied. This determines the need for additional scientific research in this area.

METHODOLOGY

This study used the following scientific methods to study the prospects for applying artificial intelligence technologies in trade union activities:

- **Analysis and synthesis method**– study and generalize existing scientific literature,

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international experiences, and practical examples;

- **Comparative analysis method**– compare the use of AI in trade union activities in different countries;
- **Modeling method**– develop a conceptual model for introducing SI into the activities of trade unions;
- **Expert evaluation method**– taking into account the opinions of experts in the field;
- **Systematic approach**– considering unions as a single digital ecosystem.

The research used international scientific articles, organizational reports, the experience of digital platforms, and open statistical data as sources of information.

As a result of the methodology, the main directions, stages, and efficiency factors for introducing artificial intelligence into the activities of trade unions were identified.

The study also used a conceptual approach to modeling decision-making processes based on artificial intelligence. Through this approach, a systematic mechanism for implementing digital solutions in trade union activities was developed.

DISCUSSION AND RESULTS

Artificial intelligence is a system of digital technologies that aims to implement human thinking and decision-making processes through algorithms. [3]. For trade unions, AI provides the following key advantages:

- Artificial intelligence technologies play an important role in automating communication processes. They provide 24/7 consultation with members, receive appeals, and direct them to the appropriate departments.

Basing decision-making on data. Analyzing data and resolving labor disputes

- creates conditions for forecasting and identifying socio-economic trends.
- Efficient use of labor resources. Ensures that employees focus on skilled tasks by automating routine and monotonous tasks.
- Increase transparency and trust. Algorithmic justification of decisions ensures reduction of abuses and increased participation of members in activities.

One of the most important tasks in the work of trade unions is to quickly and efficiently process appeals. Chatbots and virtual assistants based on SI technologies significantly facilitate this process.

Using NLP (natural language processing) technologies, chatbots understand the user's question and provide relevant information. For example, a mobile app developed by the German trade union IG Metall allows members to get advice on wages, holidays, and labor rights 24/7 [4]. Such systems not only provide advice, but also automatically direct the request to the appropriate legal department or responsible specialist, depending on the content of the request.

In the US, mobile applications developed by the AFL-CIO federation allow for information on labor rights, notification of strikes, and collection of feedback from members [6].

Predicting labor disputes before they occur and taking preventive measures is one of the necessary areas of application of AI. Based on the data collected in the system (collective agreements, labor contracts, salary dynamics, complaint statistics, history of relations with the employer), machine learning algorithms assess the likelihood of disputes occurring [7].

A forecasting model developed by LO Sweden analyzes factors such as wage levels, working hours, and labor discipline violations to identify enterprises at highest risk. This allows the trade union to timely organize preventive measures (legal consultations, negotiations, and increasing the legal literacy of employees) in them [8].

One of the main areas of activity of trade unions is the development of collective agreements and monitoring their implementation. AI technologies create the following opportunities in this process:

- Automatic verification. Artificial intelligence analyzes the text of the contract for compliance with labor legislation. If illegal or inaccurate changes are detected, the system warns and provides recommendations for corrections.
- Benchmarking. The system compares contracts across industries, regions, and companies to identify best practices. This enables unions to leverage digital evidence in negotiations.
- Contract implementation monitoring. The implementation of assigned activities is automatically tracked, and reminders are sent to those responsible for overdue or unfulfilled activities.

AI algorithms provide segmentation of members based on demographic, professional, geographic, and other characteristics. A separate communication strategy is developed for each segment, and customized messages are sent about events, tips, and benefits that are of interest to members.

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For example, offering digital literacy and professional development courses to young workers, while providing information on social security and health care to members of retirement age, can increase member satisfaction and ensure their active participation in the organization [9].

Blockchain technology is a technology that allows for distributed storage of data, ensuring its immutability and transparency. Blockchain can be used in integrated information systems in the following areas:

Making voting processes transparent. In trade unions, a blockchain-based voting system can be used to elect chairmen and other bodies, and to make necessary decisions. In this case, each vote is recorded on the blockchain and cannot be changed later. This ensures the transparency and fairness of the voting process, and prevents corruption.

Calculation of membership fees. Blockchain technology allows for transparent accounting of membership fee payments. Each payment is recorded on the blockchain, and its preparation, direction, and expenditure can be tracked. This increases the trust of members and prevents financial abuses.

Guaranteeing the integrity of contracts. Placing community contracts on the blockchain ensures that they cannot be changed later. The text of the contract, the parties who signed it, and the time it was signed are stored on the blockchain and can be verified at any time.

Ensuring data integrity. Storing copies of necessary information (membership lists, financial reports) on the blockchain ensures their integrity and protection from unauthorized changes.

When combined with blockchain technology, artificial intelligence creates opportunities such as transparency of voting processes, data integrity, and prevention of abuse. In South Korea, labor unions are using a blockchain-based voting system in their electoral processes to guarantee the authenticity of every vote [10].

The introduction of AI technologies into the activities of trade unions also poses a number of risks. It is necessary to assess them in advance and take measures to eliminate them.

Table 1
Preliminary risk assessment and mitigation measures

Type of risk	Description	Elimination measures
Data security	Personalmmisuse or disclosure of information	Data encryption, role rights restriction, audit logging
The probability of models making mistakes	AI models are not 100% accurate and may give inaccurate forecasts.	Regularly test models, maintain human control, and confirm important decisions with experts
Personnel training	Unpreparedness of employees to work with AI systems	Continuing education programs, manuals, technical support service
Ethical problems	AI algorithms may contain elements of unfairness or discrimination	Disclosing the principles of operation of algorithms, conducting ethical audits
Legal restrictions	The use of AI systems is not fully regulated by law.	Monitoring legislative changes, developing internal regulatory documents

Practical experiences It is advisable to implement the introduction of AI technologies in stages:

1. **Preparatory stage (4–6 months).**Collect, clean, and label existing data; assess technical infrastructure; form a project team.

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2. **Pilot project (6–12 months).**Develop and test a chatbot or appeal analysis model; approve in pilot organizations; make adjustments based on user feedback.
3. **Large-scale implementation (12–18 months).**Add modules such as labor dispute forecasting, collective bargaining analysis; train employees; and ensure the stable operation of the system.
4. **Monitoring and improvement (continuous).**Re-train models based on new data, evaluate system performance, and add new functionality.

The scientific novelty of this study is as follows:

- A conceptual model for introducing artificial intelligence into the activities of trade unions has been developed;
- an analytical approach to forecasting labor disputes was proposed;
- The possibilities of using intellectual technologies in the analysis of collective agreements were substantiated.

CONCLUSION AND SUGGESTIONS

Artificial intelligence technologies create conditions for radically improving the activities of trade unions, raising communication with members to a new level, predicting labor disputes in advance, improving the quality of collective agreements, and scientifically substantiating management decisions. However, the introduction of AI requires great responsibility, a serious approach to data security, and regular training of employees.

PRACTICAL RECOMMENDATIONS:

1. The activities of trade unions`Develop a long-term strategy for the implementation of AI, identifying key areas, stages, responsible executors, and funding sources.
2. Pay special attention to database cleaning and standardization, as the accuracy of AI models is directly dependent on the quality of the input data.
3. Starting with initial solutions like a chatbot, gradually moving to more complex forecasting and analysis modules.
4. To improve the digital competencies of employees and organize special training on working with AI systems.
5. Ensuring data security and compliance with ethical standards, creating internal audit and control mechanisms.

The effective use of artificial intelligence in the activities of trade unions strengthens their position in the modern labor market, increases the trust of members and contributes to the formation of new, digital forms of social partnership.

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