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The impact of artificial intelligence on the digital transformation of Chinese trade unions

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Abstract
In the digital era of the 21st century, artificial intelligence, as a cutting-edge technology, is causing profound changes globally. China, as a populous country, is renowned worldwide for its rapid economic and social development and rapid technological progress. In this context, the digital transformation of Chinese trade unions, as an important bridge connecting the government, enterprises, and employees, has become an inevitable choice to enhance work efficiency and strengthen public service capabilities. Artificial intelligence has a positive impact on the digital empowerment of Chinese trade unions, including promoting the improvement of trade union work efficiency, enhancing the quality and scope of trade union services, meeting the diverse needs of employees, and strengthening the organizational power and influence of trade unions, promoting the sustainable development of the Chinese trade union cause. By utilizing artificial intelligence technology, the digital transformation of trade unions can be propelled, elevating the intelligence and precision level of trade union work. Trade unions should actively embrace artificial intelligence technology, continuously explore innovation to adapt to the development needs of the digital economy era.

Keywords
Artificial Intelligence; Chinese Labor Union; Digital Construction.

1.Overview

The 20th National Congress of the Communist Party of China has outlined the development direction for Chinese trade unions, emphasizing the flexible and full use of current scientific technology and methods to support and guarantee the advancement of public administration services. Artificial intelligence has been widely applied in the field of social public administration in China, including aspects such as social life, public decision-making, and economic management. The Chinese trade unions are an important hub organization for the Communist Party of China to connect with the working masses, serving as a crucial social pillar of the national political power and playing an indispensable role in social management. With the continuous development of digital technology, the work and life of the working masses are also undergoing constant changes, requiring the Chinese trade unions to keep pace with the times and fully utilize information technology to provide better services to the vast number of workers.

Since the term "artificial intelligence" was first proposed in 1956, it has undergone nearly 70 years of developmen. In recent years, rapid advancements in digital technology have led to a period of high-speed development in the field of artificial intelligence. The development of big data, algorithms, machine learning, natural language processing, hardware, and other aspects has injected strong momentum into the real-world

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applications of artificial intelligence. Artificial intelligence is now widely used in industries such as finance, healthcare, retail, automotive, smart homes, and media. It has brought enormous economic benefits to human society, driving society towards an unprecedented new historical stage and its revolutionary progress in theory and technology has had profound impacts on society.

The digital transformation of Chinese trade unions is the direction and trend of their future development, which will have a profound impact on the work of trade unions. The continuous development of artificial intelligence technology has become the forefront of current information digital technology research, and empowering the digital transformation of Chinese trade unions with artificial intelligence is of great practical significance.

The remaining structure of this article is as follows: the second section is a literature review, reviewing research in related fields. The third section introduces the development and application of artificial intelligence and large-scale models. The fourth section describes the relevant situation of the digital construction of Chinese trade unions. The fifth section explains the impact of artificial intelligence on empowering the digital transformation of Chinese trade unions. The sixth section provides a summary and recommendations for this article.

2.Literature Review

Artificial Intelligence (AI), as a technology that imitates human intelligence, has made significant progress in scientific research and practical applications in recent years. The research scope of artificial intelligence is wide, mainly including machine learning, deep learning, natural language processing, computer vision, and robotics, among several subfields. Machine learning, as the core of artificial intelligence, enables machines to learn from data through algorithms without explicit programming. Deep learning, by mimicking the neural network structure of the human brain, can process and analyze large amounts of unstructured data. Natural language processing (NLP) enables computers to understand, interpret, and generate human language to achieve human-machine interaction. Computer vision allows machines to "see" and understand images and videos, enabling functions such as scene recognition and image classification. Robotics applies artificial intelligence to physical machines, enabling them to perform specific tasks.

In the research and application of artificial intelligence, several core viewpoints are worth noting. Data is the foundation of artificial intelligence development, and the collection, processing, and analysis of big data are indispensable for training AI models. Algorithm innovation is key to driving the progress of artificial intelligence. With the improvement of computing power and algorithm optimization, deep learning has made breakthrough progress in image recognition, speech recognition, natural language processing, and other areas. The integration of interdisciplinary fields is an important trend in the development of artificial intelligence, such as applying theories from psychology and cognitive science to AI research to better mimic human thinking and behavior. Artificial intelligence technology is gradually maturing, demonstrating enormous potential in various fields such as healthcare, finance, education, and transportation. Despite significant progress, artificial intelligence still faces many challenges, such as data privacy protection, algorithm bias, and human-machine interaction.

With the rapid development of information technology, digital transformation has become an important global trend across various industries. In this context, the Chinese trade unions, as the bridge and link between the party, government, and the vast number of workers, are particularly important in their digital

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construction. Current academic research mainly focuses on the application of information technology, digital transformation strategies, and the construction of workers' service systems. Early research mostly concentrated on the application of information technology in trade union work, such as the construction of information management systems and the development of online platforms. In recent years, with the continuous development of digital, networked, and intelligent technologies, the research perspective has gradually broadened to focus on how trade unions can use big data, cloud computing, artificial intelligence, and other emerging technologies to improve service quality and efficiency, as well as how to construct a digital workers' service system.

Most studies believe that digital transformation is of great significance in enhancing the modernization level of trade union work and strengthening the ability to serve workers. Digitization can not only optimize the internal management of trade unions but also better meet the needs of workers by providing more convenient and personalized services. The people-oriented service concept is crucial in the digital construction, emphasizing user experience as the key to achieving the transformation and upgrading of trade union service functions. Trade unions need to better understand and grasp the needs of workers through digital means, providing more precise and efficient service.

3.The Development and Application of Artificial Intelligence and Large Models

Artificial intelligence is a new technological science that researches and develops theories, methods, technologies, and application systems for simulating, extending, and expanding human intelligence. It is a branch of computer science that attempts to understand the essence of intelligence and produce intelligent machines that can react in a way similar to human intelligence. Research in this field includes robotics, language recognition, image recognition, natural language processing, and expert systems.

The development of artificial intelligence can be traced back to the 1950s, when research mainly focused on symbolic logic methods, attempting to simulate human thinking processes through hard-coded rules. However, due to the limitations of computing power and the lack of scalability of rules in complex environments, this approach gradually showed its limitations. In the 21st century, with significant improvements in computing power and the availability of big data, machine learning, especially deep learning technology, has rapidly become the mainstream direction of artificial intelligence research. By simulating the neural network structure of the human brain, deep learning can automatically learn features and patterns from large amounts of data, greatly improving the accuracy and efficiency of task processing.

The advancement of deep learning has led to the emergence of large model technology. The research and development of large models are mainly based on three technical routes: BERT model, GPT model, and hybrid T5 model. GPT and BERT are the two most famous representatives among them. GPT, through pre-training on a large amount of text data, has acquired rich language knowledge and logical reasoning abilities, and can perform excellently in various language tasks. BERT, through pre-training, understands the bidirectional relationships between words in sentences, improving the machine's understanding of natural language, especially in the application of semantic understanding. The emergence of these large models is not only a great advancement in artificial intelligence technology, but also opens up new avenues for its application. In data analysis, large models can handle and analyze massive amounts of data, identify complex patterns and trends, and provide valuable insights for businesses. In decision support systems, the combination of large models' predictive and optimization abilities can provide more accurate and personalized

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decision recommendations. The incorporation of large models has also made automated processes more intelligent and efficient, enabling automation of operations from simple data entry to complex business processes. In terms of user interaction, the application of large models makes chatbots and personalized recommendation systems more intelligent, providing a more natural and personalized user experience.

The current application scope of artificial intelligence and large-scale models is extremely wide, covering multiple industries such as education, healthcare, finance, and manufacturing. In the field of education, AI technology can provide personalized learning solutions by analyzing students' learning habits and mastery, recommending suitable learning materials to improve learning efficiency. In the healthcare industry, the application of AI is fundamentally changing traditional diagnosis and treatment methods. By analyzing a large amount of medical data, AI can assist doctors in disease diagnosis, and in some areas, the accuracy of AI diagnosis has surpassed that of human experts. In the finance sector, AI technology is used for risk management, fraud detection, and intelligent investment advisory, greatly enhancing the efficiency and security of financial services. In the manufacturing industry, the introduction of AI technology makes intelligent manufacturing possible. AI not only improves production efficiency but also reduces production costs by implementing predictive maintenance to minimize equipment failures.

4.Digitalization of Chinese Labor Unions

Traditional trade unions have difficulty in fully covering and meeting the individualized needs of workers, and there is a need to reform and innovate the work mode of trade unions using new technologies. By leveraging advanced technology, we can improve service quality and efficiency, realizing the goal of "letting data run more and workers run less", expanding the channels for trade unions to connect with workers, and better serving the vast number of workers with information technology, continuously strengthening the mass base. Against the backdrop of continuous development in information technology, a series of policy documents, important meetings, and reports issued by Chinese national leaders and the government have outlined the direction and key focus of the development and construction of Chinese trade unions, requiring comprehensive acceleration of the digitalization of trade unions.

Chinese trade unions started late in the digital construction, and there is a significant gap compared to the accumulation of digital government construction. The trade union's business scope is wide, so it has encountered many difficulties in top-level design and overall planning. The differences in local politics, economy, culture, and talent have also led to uneven levels of digital construction of trade unions in various regions. The informatization of trade unions mainly relies on hardware infrastructure such as system servers and network communication. Its computing power planning and construction are mostly based on the system requirements of various departments or regional trade unions, making it difficult to meet the requirements of modern technologies such as cloud computing, big data and development of trade unions.

The data processing and modeling methods are not scientific enough, resulting in low data transformation efficiency, which hinders data-driven business execution, innovation in worker services, and management decision-making. This limits the ability to meet the personalized needs of workers and improve the efficiency of trade union business, leading to an unclear effect of digital empowerment. In addition, trade unions lack sufficient user orientation in serving the masses of workers, resulting in insufficient attractiveness and limited platform traffic.

The digitization of trade unions faces problems such as inconsistent data standards and norms, and outdated data collection methods, which hinder the effective integration and utilization of data, and impede comprehensive interconnection of business and services. To improve work efficiency and worker satisfac-

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tion, it is necessary to establish unified business processes and service standards, and achieve data-driven business and service innovation through digital means, thereby changing the traditional manual work mode.

The digital construction of Chinese trade unions also faces the problem of insufficient dual user orientation for trade union workers and members, limited scope of digital applications, and overlapping construction. Digital system developers have insufficient understanding of trade union business, making it difficult to design application scenarios that meet the requirements. Some trade union workers are not familiar with digital technology, and thus cannot accurately put forward requirements, leading to a disconnect between digital technology and trade union business.

Trade union workers' thinking still remains in traditional trade union work thinking, without establishing a digital work thinking mode, and their digital literacy and skills still have some shortcomings. Trade union workers excessively rely on experience, intuition, or superior instructions in their work, and depend on fixed, linear work processes and manual operations, making it difficult to adapt to rapid iteration and flexible work processes and automation execution. This contrasts sharply with the digital way of focusing on data-driven business execution and decision-making and using real-time digital information to guide actions.

5.The impact of artificial intelligence on the digital transformation of Chinese trade unions

Artificial intelligence technology is profoundly changing the production, lifestyle, and thinking patterns of human society. In this process, China, as the world's largest developing country, and its trade union organizations, as important bridges connecting the government, enterprises, and workers, are facing unprecedented challenges and opportunities. AI not only provides new tools and methods for trade union organizations but also has a profound impact on their functional positioning and service models. It plays an important role in promoting the digitalization of Chinese trade unions, improving work quality and efficiency, enhancing service capabilities, and improving member interactions.

AI technology can significantly improve the quality and efficiency of trade union work. By utilizing deep learning, data mining, and intelligent information processing systems, trade unions can rapidly process and analyze large amounts of complex data, effectively improving the scientificity and accuracy of decision-making. For example, by using natural language processing (NLP) technology, automated processing of member inquiries and feedback can quickly identify and respond to workers' key concerns, providing effective solutions and reducing manual involvement, thereby improving processing speed and work efficiency. Advanced technologies such as big data analysis and cloud computing enable a more precise understanding of workers' needs, facilitating precise services and the formulation of more practical service plans and policies, enhancing the scientificity and accuracy of decision-making.

AI technology can significantly enhance the quality and scope of services provided by trade unions. By utilizing AI, trade unions can offer more personalized and precise services. Through intelligent customer service systems, employees can access answers to their concerns at any time, greatly improving response speed and satisfaction. The application of AI technology also provides innovative service possibilities for trade union organizations. By using intelligent recommendation systems, trade unions can recommend courses and materials tailored to employees' learning history and interests, thereby improving the effectiveness and targeting of learning. Additionally, virtual reality (VR), augmented reality (AR), and other technologies can provide employees with a more vivid and intuitive learning experience, enhancing the appeal and

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interest of learning. Developing new service projects using AI technology, such as online vocational training and virtual labor law consulting, can provide workers with more convenient and personalized services, breaking the limitations of time and space and benefiting more workers.

AI technology can significantly promote interaction and communication between trade unions and employees. Through AI tools such as chatbots and virtual assistants, trade unions can engage with employees 24/7, promptly addressing their questions and providing necessary assistance and support. This round-the-clock interaction not only strengthens employees' trust and reliance on trade unions but also enables the timely identification and resolution of employees' issues, effectively safeguarding their rights. Furthermore, harnessing the power of AI can build more intelligent and efficient communication platforms, promoting information sharing and experience exchange among members. For example, forums and social networking platforms optimized by machine learning algorithms can intelligently recommend relevant discussion topics and content based on users' behavior and preferences, increasing user engagement and stickiness.

AI technology has a significant impact on the digital empowerment of trade unions in China. Chinese trade union organizations need to continuously strengthen their own development, actively embrace AI technology, and continually explore and optimize digital service models to better adapt to the development needs of the new era and more effectively safeguard workers' legitimate rights and interests. At the same time, the support and cooperation of the government, enterprises, and all sectors of society are also needed to jointly promote the process of trade union digital transformation, making positive contributions to building harmonious labor relations and promoting social stability and development.

6.Conclusion

The digitalization of trade unions is a requirement of the times for the development of trade unions in China, and it will have a profound impact on the future work of trade unions. For the future development of Chinese trade unions, artificial intelligence technology is both an opportunity and a challenge. Chinese trade unions need to adopt effective response strategies, increase research and application of cutting-edge technologies such as artificial intelligence, strengthen talent development and technological updates, and ensure that trade unions occupy a favorable position in the process of digital transformation. At the same time, it is important to establish a sound system for privacy protection and information security to ensure the personal information security of workers, enhance workers' confidence and satisfaction with the digital transformation of trade unions, strengthen cooperation with the government, enterprises, and research institutions, and jointly promote the healthy development and application of artificial intelligence technology to empower the digitalization of trade unions in China.

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