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PROBLEMS AND PROMOTING THE DEVELOPMENT OF SMART INDUSTRY IN CHINA

The article is devoted to the development of smart industry in China. The main problems constraining the development of smart industry are revealed: the low share of industries with high added value, the insufficient level of investment in research and development of smart industry technologies, problems with ensuring the data privacy and security in artificial intelligence systems, as well as the opacity of decision-making processes in artificial intelligence systems, which are the basis of smart industry. Directions for the development of smart industry in China have been developed: optimizing the structure of smart industry and modernization of traditional industries, developing new professions and opportunities for the labor market, harmonious development of artificial intelligence and workforce, strengthening privacy and data protection, which will ensure sustainable and socially responsible development of Chinese society .

Keywords: *smart industry, artificial intelligence, information security*

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ПРОБЛЕМЫ И НАПРАВЛЕНИЯ РАЗВИТИЯ УМНОЙ ПРОМЫШЛЕННОСТИ В КИТАЕ

Статья посвящена развитию умной промышленности в Китае. Раскрыты основные проблемы, сдерживающие ее развитие: низкая доля отраслей с высокой добавленной стоимостью, недостаточно высокий уровень инвестиций в исследования и разработки технологий умной промышленности, проблемы с обеспечением безопасности и конфиденциальности данных, а также непрозрачность процессов принятия решений в системах искусственного интеллекта, которые являются основой умной промышленности. Разработаны направления развития ее в Китае: оптимизация структуры умной промышленности и модернизация традиционных отраслей, развитие новых профессий и возможностей для рынка труда, гармоничное развитие искусственного интеллекта и рабочей силы, усиление конфиденциальности и защиты данных, что позволит обеспечить устойчивое и социально ответственное развитие китайского общества.

Ключевые слова: *умная промышленность, искусственный интеллект, информационная безопасность*

Intelligent industry refers to the industrial model that uses intelligent technology to transform traditional industries, build a new industrial pattern, and promote the transformation and upgrading of industries to the direction of high quality, high efficiency, low carbon and environmental protection. Smart industry not only includes emerging fields such as information technology, smart manufacturing, and smart logistics, but also has wide applications in traditional industries, such as smart home, smart medical care, and smart transportation [1].

The purpose of the study is to develop directions for the development of smart industry in China based on an analysis of its current state and the problems hindering its development.

Taylor believes that China still faces challenges in the core technology and data security of the smart industry, but through measures such as strengthening independent research and development and innovation, and strengthening cooperation and exchanges, these problems can be gradually solved and the sustainable development of the smart industry can be promoted [2].

Black believes that China has a huge market size, rich application scenarios and strong innovation capability in the smart industry, which are key factors to promote the development of the smart industry. At the same time, the Chinese government has also adopted a series of strategic planning and policy measures in the development of the intelligent industry, such as "Made in China 2025" and "Internet Plus", which have provided strong support for the development of the intelligent industry [3].

Hu Dayong believes that policy support has an important impact on the development of China's smart industry. He believes that policy support can promote the research and development and application of smart technologies, optimize the business environment, and promote the development of the smart industry. At the same time, he also believes that policy support needs to further increase investment in the research and development of smart technologies, encourage more enterprises to participate in the development of the smart industry, and improve the international competitiveness of China's smart industry [4].

The development of China's smart industry has had a positive impact on the economy and society. Through continuous innovation and application of new technologies, China is gradually achieving industrial upgrading and economic transformation, laying a solid foundation for sustainable development in the future.

According to statistics, the proportion of technology research and development investment in the field of intelligent manufacturing in China is only about 2 % of GDP, while developed countries are generally 3 % – 5 % . This shows that there is still much area for improvement in China's investment in intelligent manufacturing technology innovation [5].

The proportion of hardware manufacturing in China's intelligent manufacturing industry is more than 70 % , while the proportion of high value-added fields such as software development and system integration is less than 30 % . In contrast, the proportion of high value-added fields in developed countries is generally more than 50 % . The penetration rate is only about 10 % , while it is generally more than 30 % in developed countries. This shows that there is still much room for improvement in the market promotion and application of intelligent manufacturing products in China.

More than 80 % of respondents expressed concerns about data privacy and security issues in AI. This indicates the need to strengthen protection measures in terms of data privacy and security during the development of AI technology. As can be seen from Figure 1, the highest proportion of data leakage is 35 % ; followed by data abuse accounting for 25 % .

It can be seen that there are big problems in China's AI data security. Intelligent manufacturing will continue to be an important driving force for industrial upgrading. With the development of technologies such as the Internet of Things, big data and cloud computing, smart manufacturing will further digitize, intellectualize and personalize the production process. Enterprises will improve production efficiency and product quality by introducing advanced industrial Internet platforms to achieve real-time collection, analysis and optimization of production data. Meanwhile, smart manufacturing will promote the deep integration of manufacturing with other industries and form a new industrial ecosystem [6].

The focus on AI transparency and explainability is increasing year by year over time. This reflects the increasing attention of researchers to the problem of opaque decision-making in AI systems. Transparency and explainability are key aspects of AI ethics. When an AI system makes a decision, if its decision-making process is not transparent enough or interpretable enough, it will make it difficult for users to understand the system's decision-making logic, and thus difficult to judge its rationality and fairness. In this case, users may not be able to trust the AI system, which in turn affects its application in various fields.

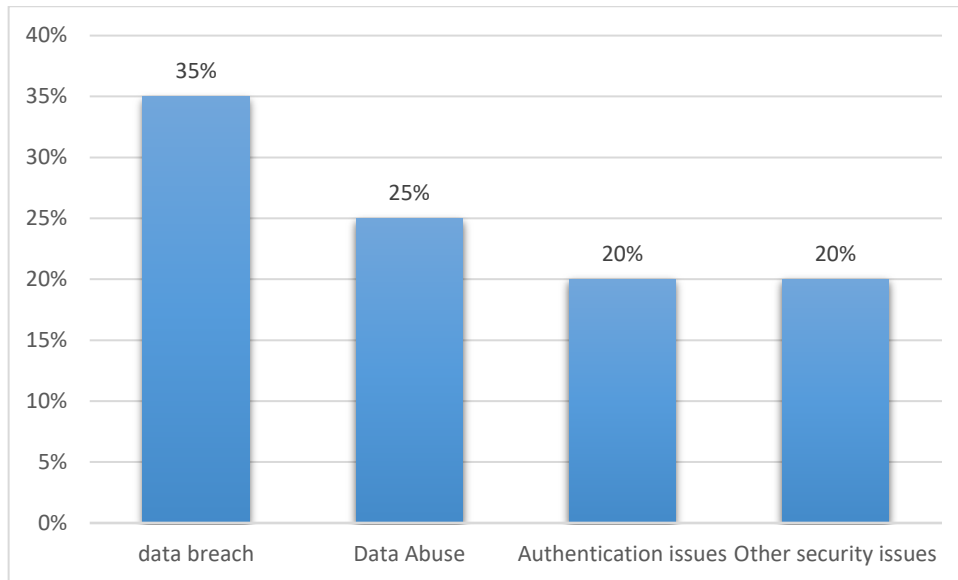


Fig. 1. Data share of AI data privacy and security issues

Therefore, it is essential to improve the transparency and interpretability of AI. This will not only help build users' trust in the system, but also promote the healthy development of AI technology. To achieve this goal, researchers need to constantly explore new methods and techniques to ensure that the decision-making process of AI systems is more transparent and explainable. At the same time, policymakers and regulators also need to develop corresponding norms and standards to promote the sustainable development of the AI industry [7].

According to statistics, more than 1 million jobs have already been replaced by automation worldwide. This indicates that the development of artificial intelligence technology may have some impact on the human labor market. Figure 2 shows the proportion of labor force reduction and increase due to the application of AI in different industries. As can be clearly seen from the chart, there are differences in the degree to which different industries are affected by AI. In manufacturing, about 20 % of the workforce may be at risk of a reduction due to automation and robotics, but at the same time, 5 % of the workforce may gain additional job opportunities due to increased productivity. In the financial services industry, about 15 % of the workforce is reduced due to the introduction of AI, but 10 % of the workforce is increased due to fintech innovation. In the health care industry, AI is mainly used to assist in diagnosis and treatment, which led to a reduction of about 10 % of the workforce, but also created 20 % of the new workforce opportunities, mainly in areas such as data analytics, medical technology research and development. The education sector is less affected, with only about 5 percent of the workforce at risk, but 25 percent of the workforce is gaining jobs due to the rise of personalized teaching and online education. In other industries, the effect is more even, with about 10 percent of the workforce likely to lose jobs and 10 percent of the workforce gaining jobs [8].

The analysis of the chart shows that the impact of AI application on the labor force varies in different industries. While some industries may face the risk of reducing the workforce, it also creates opportunities for additional workers in others.

Therefore, governments, businesses and workers need to actively adapt to this change and address the challenges and opportunities presented by AI through measures such as training and education.

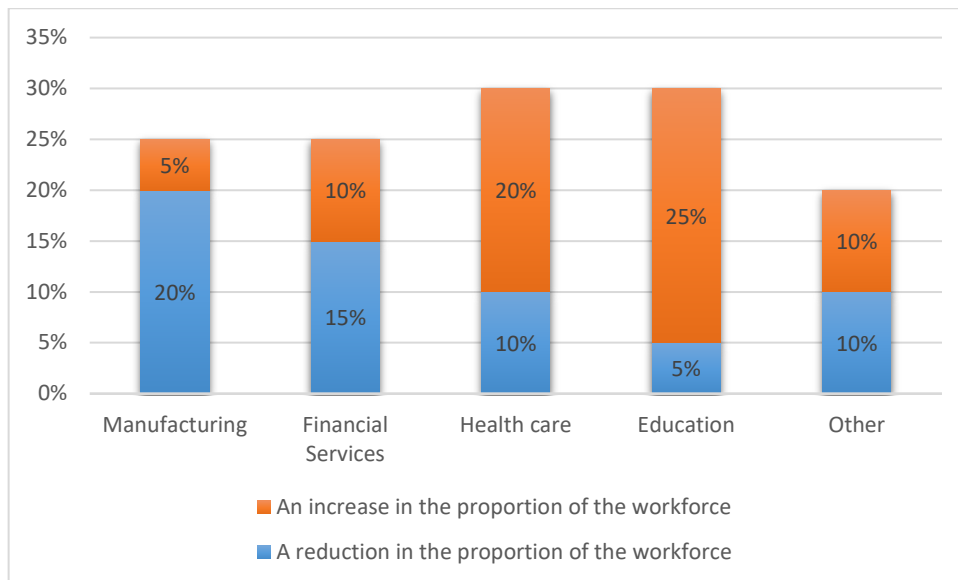


Fig. 2. Proportion of AI's impact on human labor force

The future development direction of China's smart industry will be mainly reflected in the following aspects. Smart manufacturing will continue to be an important driving force for industrial upgrading. With the development of technologies such as the Internet of Things, big data and cloud computing, smart manufacturing will further digitize, intellectualize and personalize the production process. Enterprises will improve production efficiency and product quality by introducing advanced industrial Internet platforms to achieve real-time collection, analysis and optimization of production data. Meanwhile, smart manufacturing will promote the deep integration of manufacturing with other industries and form a new industrial ecosystem.

Artificial intelligence will be more widely used in various fields. With the improvement of algorithms and the enhancement of computing power, AI will make greater breakthroughs in areas such as speech recognition, natural language processing and computer vision. AI technology will further penetrate into various industries such as healthcare, education, finance and transportation, changing the way people live and work. In the future, China should strengthen basic research on AI, train a team of high-quality talents, and promote the innovation and application of AI technology.

New energy vehicles will gradually become the main mode of transportation. With the continuous progress of battery technology and the improvement of charging infrastructure, the driving range and charging experience of new energy vehicles will be significantly improved. At the same time, the government will continue to increase support for the new energy vehicle industry to promote the popularization and industrial upgrading of new energy vehicles. In the future, China should strengthen research and development of core technologies for new energy vehicles and improve its capacity for independent innovation, while strengthening the construction of charging infrastructure to provide a strong guarantee for the development of new energy vehicles.

In view of the above development directions, the following suggestions for the development of China's intelligent industry are relevant.

1. Strengthen basic research and technological innovation. China should increase investment in basic research and technological innovation related to the smart industry, encourage enterprises, universities and research institutions to strengthen cooperation, and promote research and development and breakthroughs in core technologies.

2. To optimize the industrial structure, the optimization and upgrading of the smart industry can boost economic growth and improve production efficiency and economic benefits. By introducing new technologies, new equipment and new processes, product quality can be improved and pro-

duction costs reduced, thus enhancing the competitiveness of enterprises. The optimization of the industrial structure of the smart industry can promote the transformation and upgrading of traditional industries, and promote the development of the industry in the direction of high-end, intelligent and green. This can not only improve the added value and efficiency of the industry, but also reduce resource consumption and environmental pollution. Smart industries are technology-intensive, and the optimization of their industrial structure can promote technological innovation and talent training, and facilitate the continuous emergence of new technologies, products and services. This can not only improve the industry's innovation capacity and competitiveness, but also inject new impetus into economic development. The optimized industrial structure of the smart industry can create more job opportunities and promote the stability and development of the labor market. With the continuous development of the smart industry, more new occupations and positions will be created, providing more choices for the job market. In short, the optimization of the industrial structure of China's smart industry can promote the development of economic growth, industrial upgrading, innovative development and job opportunities, and provide strong support for the high-quality development of China's economy.

3. Strengthening the market application and promotion, China's intelligent industry to strengthen the market application and promotion can promote the expansion of market scale, product competitiveness, technological innovation, industrial synergy and economic development and other aspects of the development, to provide strong support for the healthy and rapid development of the intelligent industry.

4. Strengthening data privacy and security protection, China's smart industry to strengthen data privacy and security protection can enhance user trust, promote compliance management, enhance industrial competitiveness and protect national interests and other aspects of the development, to provide a strong guarantee for the sustainable development of the smart industry. At the same time, it also meets the concerns and requirements of the international community on data privacy and security protection, and helps to enhance the international image and influence of China's smart industry.

5. Improving the transparency and explainability of artificial intelligence can promote the development of public trust, technology research and development, industrial development and regulation formulation, and provide strong support for the healthy and rapid development of the smart industry. At the same time, it is also in line with the requirements of AI ethics and sustainable development, helping to promote the application and popularization of AI technology in a wider range of fields.

6. Promoting the harmonious development of AI and human labor force in China's intelligent industry can improve work efficiency, create new job opportunities, promote social equity and promote scientific and technological innovation. This will help achieve sustainable economic and social development and build a more harmonious and prosperous society.

7. Strengthening investment in research and development, China's smart industry to strengthen investment in research and development can promote. It will promote technological innovation, industrial upgrading, personnel training, economic growth and the promotion of international status. This will help promote the sustained, healthy and rapid development of China's smart industry and make important contributions to the country's economic prosperity and development.

8. Strengthening research and development of security technology in China's smart industry can guarantee data security, enhance system security, promote the healthy development of the industry, enhance international competitiveness and promote social trust and other aspects of development. This will help promote the sound, safe and sustainable development of China's smart industry and make an important contribution to the prosperity and development of the country's economy.

9. Cultivate a team of high-quality talents. The development of the intelligent industry needs a large number of high-quality talents. China should strengthen the construction of its education and training system to cultivate professionals with innovative capabilities and practical experience. The first is to form knowledge concepts within enterprises, innovate talent incentive systems, and promote information sharing within Chinese enterprises. The second is to establish a digital mechanism for lifelong learning in Chinese enterprises to provide employees with digital lifelong education covering the whole career and improve the digital literacy of employees in Chinese enterprises. The third is to cooperate with Chinese enterprises in the industry and encourage employees to participate in relevant training activities. Fourth, relevant departments should strengthen the provision of courses related to intelligent economy and intelligent technology in the field of higher education, and build a general education curriculum system with the awareness of intelligent talents as the main focus. Fifth, build a practice platform related to the intelligent industry.

To sum up, the future development direction of China's intelligent industry will be mainly reflected in the fields of intelligent manufacturing, artificial intelligence and new energy vehicles. To achieve sustainable development and economic transformation, China should strengthen basic research and technological innovation, cultivate a team of high-quality talents, promote industrial integration and the construction of an innovation ecosystem, strengthen international cooperation and exchanges, and focus on sustainable development and social responsibility.

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