Discussion on the Application Status and Optimization Direction of Artificial Intelligence Introduced into Enterprise Management and Operation Systems

Zhibin Feng
College of Computer Science and Technology, Dongguan University of Technology, China

Keywords: Human-Machine Integration, Enterprise Management, Artificial Intelligence.

Abstract: Artificial intelligence (AI) technology, as the core driving force of the new round of scientific and technological innovation and industrial change, impacts the market competitiveness of enterprises and the composition structure of sustainable development conditions. Based on the current status of the application of the new human-machine integration mode of AI technology introduced into the enterprise management and operation system, this paper analyzes the existing technology application and drawbacks and explores the optimization path of the enterprise's application of the new human-machine integration mode from the four dimensions of the management object, attributes, decision-making and ethics. This paper concludes that the introduction of AI technology resources in enterprises requires enterprise managers to reconfigure the resource management model and coordinate the human-machine relationship. At the same time, managers are required to improve their technical quality, combine technical theories and management frameworks, and optimize the traditional management operation mode of enterprises. In addition, the participation of AI technology in decision-making requires enterprise managers to coordinate the ratio of human-machine decision-making, and proactively prevent possible risks in technology-assisted decision-making and prediction. Finally, enterprises need to proactively prevent the legal and ethical risks that may exist when AI technology is applied.

1 INTRODUCTION

According to the report of relevant market research organizations, the global artificial intelligence market size was valued at USD 279.22 billion in 2024 and is projected to grow at a CAGR of 35.9% from 2025 to 2030, while the scale of China's core artificial intelligence industry had reached 508 billion yuan in 2022 with a year-on-year growth of 18% (Grand view research, 2025; People's Daily Online, 2023). The commercialization of AI is accelerating against the backdrop of AI technology and hardware and software-related industries developing together and rapidly penetrating various traditional and emerging industries. The extensive introduction of AI technology into enterprises and the in-depth application in combination with different application scenarios have become an inevitable trend to promote fundamental changes in the management and operation mode of global enterprises.

The development trend of the artificial intelligence industry indicates that compared with vertical artificial intelligence, general artificial intelligence is no longer limited to handling a single task, and is has gradually realized the application of cross-domain, cross-discipline, cross-task and cross-modal (People's Daily Online, 2023). The high-speed iterative development of AI technology and its high adaptability in different industries with a great span of association indicates that the practical application of human-machine integration mode in enterprises in different industries is not limited to the "human-oriented and machine-assisted" single-principle development mode of manufacturing enterprises in the traditional business environment proposed by Hui Xu, Zepeng Wang, and Jindong Yang, et al. The "human-oriented, machine-assisted" single subject development model practiced by manufacturing enterprises in the traditional business environment, that is to say machines are only regarded as auxiliary production tools (Xu et al, 2024). Instead, a new human-machine integration model has been

Feng, Z.
Discussion on the Application Status and Optimization Direction of Artificial Intelligence Introduced into Enterprise Management and Operation Systems.
DOI: 10.5220/0014306800004718

In *Proceedings of the 2nd International Conference on Engineering Management, Information Technology and Intelligence (EMITI 2025)*, pages 17-22
ISBN: 978-989-758-792-4

developed that takes artificial intelligence technology as a key technical condition for enterprise management and operation. At the same time, Xu Peng, Xu Xiangyi and others proposed that the impact of artificial intelligence technology on the enterprise management and operation system can be reflected in the four dimensions of "management objects", "management attributes", "management decisions" and "management ethics". While promoting the optimization of enterprise management and operation systems and the reconstruction of human-machine collaboration models, it also poses challenges to managers in the era of artificial intelligence.(Xu et al, 2020). In this context, most of the traditional and emerging enterprises still lack a lot of theoretical and practical experience in the application of AI technology to optimize the traditional management and operation mode of enterprises, and there are still problems that need to be solved, such as loss of enterprise benefits due to improper application of the technology, inefficient application, and poor application of risk management.

The purpose of this paper is to explore the optimization path of enterprise application of new human-machine integration mode by combining the related field research and the application of artificial intelligence technology introduced into the enterprise management and operation system. On the one hand, this paper discusses the application of existing artificial intelligence technology in enterprises. On the other hand, this paper discusses the existing drawbacks and shortcomings of the technology application and the feasible optimization direction from the above four management dimensions.

2 IMPACTS AND CHALLENGES OF THE HUMAN-MACHINE INTEGRATION MODEL ON ENTERPRISE MANAGEMENT AND OPERATION METHODS

The new human-machine integration model driven by artificial intelligence technology is becoming a key driver for the development of international enterprises. Many enterprises have made significant progress in process optimization and technology application and accumulated valuable practical experience by deeply integrating AI technology with management and operation processes.

The high degree of integration of AI technology with machine learning, big data, cloud computing, the Internet of Things, blockchain and other technologies has enabled it to gain efficient and powerful information processing and analytical learning capabilities. This integration makes the various management and operation processes of the enterprise have the ability of self-perception, learning and decision-making (Chen et al, 2024), which has become an important driving force to help enterprises achieve significant results in decision support, process optimization, cost control, innovation and development (Shao, 2024). Taking the supply chain logistics industry as an example, through the integration of blockchain and AI technology, two enterprises, Jingdong and Alibaba, the enterprise has realized the automation, intelligence and efficiency improvement of supply chain logistics, thus realizing the reduction of logistics management costs, the improvement of process efficiency and the enhancement of overall market competitiveness (Chen et al, 2024). At the same time, artificial intelligence technology also assists enterprises to get rid of the limitations of manual data processing, and enables enterprises to obtain powerful market data analysis, simulation and prediction capabilities, in order to assist enterprises in making more accurate and high-quality decisions in internal management and external market interaction. For example, deep learning, an advanced branch of artificial intelligence technology, applies a model design similar to neural networks, and through the construction of a hierarchical structure, it can simultaneously understand and analyze the appearance and internal logic, thus realizing a deep understanding and simulation of the market trends, user needs and the internal operation mode of the enterprise, and thus helping the enterprise to solve deeper and more complex problems (Sun et al, 2024). For example, the Jinghui supply chain system researched by Jingdong Logistics utilizes AI for optimal solution derivation, algorithm scheduling, and model prediction, and ultimately employs simulation analysis for intelligent decision-making (Pan et al, 2024). Alibaba, on the other hand, uses a digital supply chain control tower driven by AI technology to predict risks through data mining and provide decision support for supply chain management (Chen et al, 2024). The introduction of artificial intelligence technology has brought the traditional management and operation model of enterprises to a more lean and intelligent level. It can not only provide valuable auxiliary information for corporate decision-making, but also assist enterprises in exploring management pain points and market pain points, assist enterprises in reconstructing and optimizing management and operation models, and at the same time guide enterprises to make lower-risk

decisions and choose a more suitable development direction for the enterprise, so that enterprises can maintain strong market competitiveness and internal innovation capabilities in their industry fields.

Although the new human-machine integration mode of applying artificial intelligence technology can bring great management and operation benefits to enterprises, most enterprises are still suffering from the high cost of applying the technology, shortage of related technical personnel or the conflict of adaptation with the traditional enterprise management and operation mode, so there is still a lot of room for optimization of the practical application of this technology in the management and operation system of enterprises.

The traditional human-machine integration model pays less attention to human-machine interaction design and machine performance improvement, which leads to frequent human-machine conflicts (Xu et al, 2024). Analyzed from the level of the technology users, the reasons for the emergence of human-machine conflict events are mainly manifested in the weak digital foundation of the users, and the technical quality of the enterprise users is difficult to practice the technology in the actual work. And at the level of machine technology, the reason mainly appears in the lack of effective and high-quality data collection when the technology is applied, and it is difficult for the machine to optimize the algorithm through data training and machine learning, which leads to the inability of the machine to match with the corresponding business, resulting in the misuse and waste of data and technology.

At present, professional talents are scarce in the field of artificial intelligence within China, especially composite talents who have both a deep technical background and can combine AI technology with the practical aspects of industry management (Huang, 2019). Enterprises often face a shortage of relevant technical talents in the process of digital transformation, or are limited by the technical level of managers, making it difficult to maximize the effectiveness of AI technology resources, and failing to truly achieve the deep integration of the management and technical layers. Most enterprises still rely on ready-made experience from other enterprises, or rely on imported hardware and software, technology and other phenomena, these dependence phenomena for the enterprise to bring the low degree of technology adaptation, data leakage risk, imported technology monopoly and other problems.

At the same time, the actual application of enterprise technology due to the negligence of data security issues, or lack of standardized management of data, data leakage, data forgery and other data security incidents often occur. The frequent occurrence of enterprise data security incidents demonstrates the risk of improper application of technology, and how to effectively protect enterprise data security when applying technology poses a challenge to both enterprise managers and the security optimization of the technology itself.

The problems mentioned above have become obstacles to the application of the human-machine integration model in enterprises, and have also dampened the enthusiasm of enterprises to deploy AI technology in practice, making it an urgent challenge for enterprises and the AI field to carry out synergistic development at present.

3 DISCUSSION ON THE FEASIBILITY OPTIMIZATION DIRECTION OF NEW HUMAN-MACHINE INTEGRATION MODEL IN ENTERPRISE APPLICATION

With the introduction of artificial intelligence technology, enterprises have achieved all-round optimization and breakthroughs in various management and operation processes, such as accuracy, stability and high efficiency. However, while this technology has brought technological innovation and huge opportunities to enterprises, it has also had a subversive impact on traditional enterprise management theories and human-machine relationships. Artificial intelligence innovation management refers to the strategic deployment, application and monitoring of artificial intelligence technology within an organization, aiming to optimize enterprise operations and enhance competitiveness (Yi et al, 2024). According to the research of Xu Peng, Xu Xiangyi and others, the change logic and optimization direction of artificial intelligence technology affecting enterprise management and operation systems can be specifically divided into the following four dimensions, namely "management objects", "management attributes", "management decisions" and "management ethics" (Xu et al, 2020).

First of all, in the dimension of management object, the gradually mature artificial intelligence technology is no longer limited to being a tool to assist corporate business. With the development of AI

technology, its role in corporate management continues to evolve. From being an auxiliary tool to improve efficiency, it has gradually developed into a "virtual workforce" with autonomous learning and execution capabilities and has partially replaced traditional human labor in some areas. Changes in management objects require managers to reshape the corporate management framework, break away from dependence on traditional management theories and management experience, and use artificial intelligence technology as a low-cost, high-efficiency technical resource in the corporate management system. Managers should coordinate the collaborative relationship between human employees and artificial intelligence systems, give full play to the data processing advantages of machines and the logical decision-making capabilities of humans, achieve complementary advantages, and promote the digital transformation of enterprises and the optimization of human-machine integration management models.

Secondly, in terms of management attributes, the introduction of artificial intelligence technology into the management system of enterprises has made the technical nature of enterprise management the dominant attribute. The first and most basic requirement is proficiency in the use of digital technology, enterprise managers need to combine the knowledge of related fields and the actual application scenarios of the enterprise to maximize the capabilities of artificial intelligence technology. At the same time, it also puts forward quality requirements for other employees who participate in the human-machine integration work mode of the enterprise, requiring employees to be able to operate the human-machine integration mode efficiently and improve the overall competitiveness of the enterprise in the era of digital transformation. Secondly, it is a requirement for the management technology optimization ability of enterprise managers. Enterprise managers are required to master the ability to allocate resources, flexibly adjust the management structure according to the resource situation of the enterprise, reasonably allocate human resources and technical resources, and maximize the respective advantages of resources. At the same time, enterprise managers are also required to have the ability to regulate enterprise resources and combine the data analysis ability of artificial intelligence technology to conduct macro-control and risk prevention of possible risks and enterprise losses in resource planning. In order to improve the technical nature of enterprise management, enterprises should cooperate with scientific research institutions or universities, actively introduce compound management talents, and make up for the talent gap in combination with the situation of the enterprise. In addition, enterprises should also organize technical training internally to improve the overall quality of the enterprise and adapt to the intervention of artificial intelligence technology with the overall high technical strength of the enterprise.

Thirdly, in terms of management decision-making, artificial intelligence technology can assist human beings in breaking through the limitations of human technical processing and analytical capabilities, combined with complex, multi-dimensional data to give simulation prediction results, assisting business managers to make decisions. Changes in management decision-making require enterprise managers to have the logical ability of innovative thinking so that they can analyze the actual situation according to the data fed back by the machine, and make optimal decisions by combining the actual data and the auxiliary suggestions of artificial intelligence. There are two main optimization paths: first, enterprise managers need to use artificial intelligence technology to assist decision-making at the same time pay attention to the ratio of human-machine decision-making, do not rely excessively on technology to assist decision-making, should be combined with the actual situation of the enterprise to carry out a reasonable analysis, to make the optimal decision for the interests of the enterprise. Enterprise managers should strengthen the cultivation of decision-making thinking, reduce technological dependence, and regard artificial intelligence technology as an auxiliary tool rather than a decision-maker. Secondly, the technology applied to the enterprise needs to be continuously strengthened and optimized algorithmically. The core of artificial intelligence depends on data, and the quality, quantity and management level of data will directly affect the effect of the application (Shao, 2024). Enterprises should cooperate with scientific research institutions in related fields, provide real and high-quality data for scientific research institutions, train and algorithms through data, conduct more in-depth research on the application of technology in the process, customize enterprise application scenarios, adapt to the management process of the enterprise, and promote the optimization of human-machine integration mode with the enterprise's self-research and experience system without relying on the ready-made experience of other enterprises. In this way, the accuracy of the algorithm prediction can be improved, and the risk of bias that may occur when enterprises use AI technology to make predictions and assist in decision-making can be reduced.

Fourth, in terms of management ethics, the development of artificial intelligence technology has put forward new requirements for the soundness of the legal system and also put forward management ethical constraints on the application of this technology by enterprises, which should always pay attention to not touching the legal boundaries and industry taboos in the practical application of artificial intelligence. Enterprises should pay attention to data security design when applying the technology to avoid enterprise data leakage caused by improper technology application or management. Enterprise managers can strengthen enterprise data security from the following two points. First, managers should formulate standardized processes for technology use applicable to enterprises to avoid risky operations with higher uncertainty and potential negative consequences for enterprise employees using AI technology due to the lack of normative constraints; second, enterprise managers should manage permissions for AI technology and its users to protect the access and use permissions of important enterprise data, and strictly control.

4 CONCLUSIONS

This paper discusses the main reasons for the emergence of human-machine conflict events in enterprises and analyzes the feasible optimization direction of enterprise human-machine integration mode, and draws the following conclusions:

At the level of artificial intelligence technology, the main optimization direction at this stage is to adapt to the application scenarios of various industries and develop enterprise customized in-depth application modes to match the enterprise business and improve the degree of integration with human employees; secondly, the artificial intelligence technology should also continue to strengthen and optimize the algorithms using data training, so as to improve the accuracy rate of assisting managers in decision-making, and to reduce the risk of prediction bias and decision-making errors.

At the level of enterprises and their managers, firstly, enterprise managers should actively improve their technical ability in the field of artificial intelligence, and combine it with enterprise management theory to reconstruct and improve the management and application system of enterprise human-machine integration mode, so as to transform the enterprise's human-machine conflict state into a human-machine integration mode; secondly, enterprise managers should also reasonably allocate enterprise resources and optimize the application of human and machine resources; third, enterprises should actively improve the overall quality of enterprise employees, to adapt the technology introduced and applied to the actual business, to play the maximum benefit of artificial intelligence resources. Finally, enterprises should strengthen enterprise data security management to avoid data security incidents caused by improper application of technology.

At the legal and ethical level, enterprises should work with resources from all walks of life to comply with the legal boundaries of technology application, assist in the improvement of legal regulations in related fields, clarify the main body of responsibility, and jointly maintain the market environment for the legitimate application of AI resources by enterprises.

In-depth application and development of enterprise-customized human-machine integration mode has become a key condition for enterprises to have sustainable market competitiveness. In the future, enterprises should grasp the opportunities brought by the development of technology, actively face the challenges at all levels, synchronize and actively explore the theory and practice level, and open up the development path of enterprise management and operation system highly integrated with high technology.

REFERENCES

Chen, H.; Wang, Z.; Zhang, M. (2024). Mechanism Study on Innovative Influences of AI and Blockchain on Supply Chain Logistics: Case Study of JD and Alibaba. Advances in Economics, Management and Political Sciences,109,94-100.

Grand view research(2025). Artificial Intelligence Market Size, Share & Trends Analysis Report By Solution, By Technology (Deep Learning, Machine Learning, NLP, Machine Vision, Generative AI), By Function, By End - Use, By Region, And Segment Forecasts, 2025 - 2030.

Huang, H.Y.(2019). Awareness and Thinking of Artificial Intelligence Professional Talent Cultivation in the Context of New Engineering. China University Teaching, (02):20 - 25.

Xu, H.; Wang, Z.P.; Yang J.D.(2024). From human - machine conflict to human - machine integration: human - machine relationship remodeling in manufacturing enterprises under the perspective of knowledge orchestration. China Industrial Economy, 2024,(04):170 - 188.

Pan, Y.; Wang, X.; Ye, Q. (2024). Enhancing Supply Chain Management Through Artificial Intelligence: a Case Study of JD Logistics. Advances in Economics, Management and Political Sciences, 109, 116 - 121.

People's Daily Online. (2023). Artificial intelligence empowers thousands of industries, leading the leap and transformation of digital productivity. Retrieved March

6, 2025, from http://finance.people.com.cn/n1/2023/0621/c1004 - 40019107.html

Shao, G.(2024). The Path Choice of Artificial Intelligence Enabling Chinese Enterprise. Management. Industrial Innovation Research, 2024,(23):146 - 148.

Sun, Y.W.; Xiao, X.L; Shi, A.J.(2024). Research on the application and development of artificial intelligence technology in enterprise management decision - making. Commercial Exhibition Economy, 2024,(24):149 - 152.

Xu, P.; Xu, X.Y.(2020). Logic and analytical framework of enterprise management change in the era of artificial intelligence. Management World, 2020,36(01):122 - 129.

Yi, Z.X.; Shirley A.(2024). The impact of ai innovation management on organizational productivity and economic growth: an analytical study. Int. J. Bus. Manage. Econ. Rev 7.1 (2024): 1 - 15.