Research on Innovative Applications of Intelligent Economic Management Systems

Jin Hao[1] and Peng Yan[2*]

1. Jiangxi Tellhow Animation College, Jiangxi, China
2. School of Economics and Management, Guangzhou Vocational University of Science and Technology.Guangzhou 510800,China.

Abstract. This paper aims to explore the definition, composition and innovative practices of intelligent economic management system in data-driven decision-making, artificial intelligence integration and blockchain application, and look forward to its future development direction, so as to provide reference for research and practice in the field of economic management. By combing the development history of intelligent economic management system, analyzing the application scenarios and advantages of its core technologies, and combining with actual cases for in-depth discussion. The study found that the intelligent economic management system has significantly improved the accuracy and response speed of economic management by integrating big data, artificial intelligence and blockchain technology. Data-driven decision support system realizes efficient operation of enterprises through leadership, trust, commitment and other factors. The deep integration of artificial intelligence in multiple fields promotes the optimal allocation of economic elements . Blockchain technology improves data transparency and security.

Keywords: intelligent economic management; big data analysis; artificial intelligence; blockchain technology

1 Introduction

Driven by the rapid expansion of the globalized economy and the continuous innovation of information technology, the economic management system is facing an unprecedented deep-seated change, under the constraints of information inequality and delayed decision-making, the traditional economic management mode is not enough to cope with the complexity of the needs of modern economic activities, relying on the fusion of cutting-edge technologies such as data-driven, artificial intelligence, and blockchain, the intelligent economic management system is gradually evolved into a core tool to help economic management effectiveness and decision-making accuracy [1]. The introduction of intelligent technology in the field of economic management significantly improves the accuracy and response agility, and at the same time, in complex economic scenarios, it also helps to provide multi-dimensional and flexible response strategies, and in the continuous progress of the intelligent economic management system, the innovation of the enterprise

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management mode can be realized, and at the same time, it contributes to the formulation of the government's economic policy with solid scientific support, and the economic managers rely on the big data analysis and artificial intelligence technology to accurately predict the market situation, and the economic managers rely on the big data analysis and artificial intelligence technology to accurately predict the market situation. Relying on big data analysis and artificial intelligence technology, economic managers can accurately predict the direction of the market and reasonably adjust the allocation of resources to maximize economic benefits. The use of blockchain technology plays a key role in improving data transparency and security, which significantly improves the trust of the system. This paper is dedicated to analyzing the composition of the intelligent economic management system and its evolutionary trajectory, focusing on its breakthrough attempts in data-driven decision-making, the integrated use of artificial intelligence, and the application of blockchain technology, etc., and making predictions for the future development trend of the system, in order to provide a better solution for the field of economic management. It also predicts the future development trend of the system, with a view to providing useful reference and inspiration for academic research and practical exploration in the field of economic management.

2. Overview of Intelligent Economic Management System

2.1 Definition and composition of intelligent economic management system

An intelligent economic management system refers to a management system that integrates advanced information technology, data analysis methods and artificial intelligence algorithms to achieve comprehensive perception of the internal and external environment of an enterprise and intelligent decision-making support. The system consists of multiple levels and components, mainly including the company's management system (covering economic management, organizational management and production management), ecological, social and marketing-oriented business levels, as well as external environmental factors and information environment. In this system, external environmental factors such as market conditions, laws and regulations, etc., impose restrictions on the operation of the enterprise and provide opportunities; the information environment provides support for each level by collecting, processing and analyzing data [1]. The company's management system is at the core, and through the interaction of economic management, organizational management and production management, it achieves optimal allocation of internal resources and efficient operation. The ecological, social and marketing-oriented business levels surround the company's management system in turn, reflecting the company's comprehensive considerations in terms of environmental protection, social responsibility and market demand. The application of intelligent technology in these levels can enhance the company's ability to respond quickly to market changes, enhance the fulfillment of social responsibilities and achieve the goal of sustainable development [1]. Figure 1 shows the multi-level structure and interrelationships of the

intelligent economic management system, emphasizing the importance of interaction and information flow between levels to the overall management effectiveness of the enterprise.

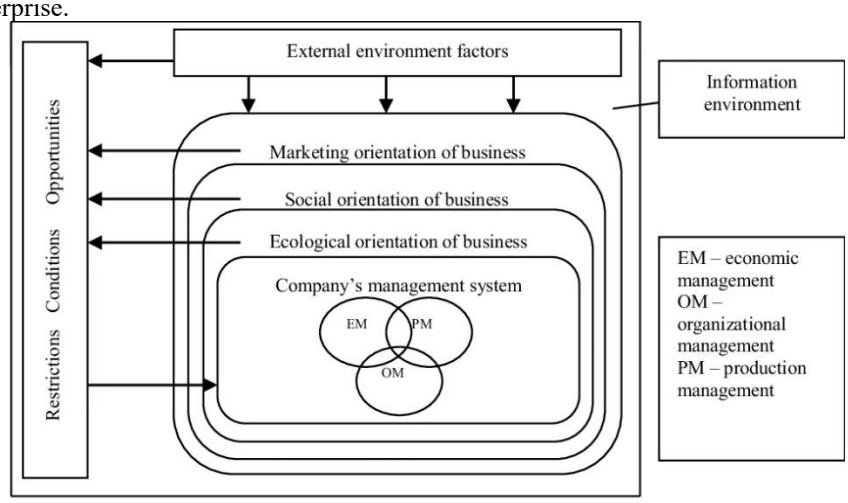

Figure 1 Multi-level structure and composition of intelligent economic management system

2.2 Development History of Intelligent Economic Management System

The development of intelligent economic management systems can be traced back to the continuous integration of information technology and management science. Initially, enterprises mainly relied on traditional management information systems (MIS), which focused on data collection and processing, improving management efficiency and information transmission speed. With the development of computer technology, decision support systems (DSS) began to be applied to enterprise management, supporting the decision-making process of enterprises through data analysis and model calculation [1]. Entering the 21st century, the rise of big data and Internet technology has significantly improved data acquisition and processing capabilities. Enterprise resource planning systems (ERP) have been widely used, integrating the resources of various departments of enterprises and realizing real-time information sharing and unified management. During this stage, intelligent technology began to show great potential in enterprise management, providing enterprises with more scientific decision-making support through data mining and analysis. In recent years, the rapid development of artificial intelligence (AI) and blockchain technology has further promoted the transformation of intelligent economic management systems. AI improves the system's prediction and automation capabilities through machine learning and deep learning algorithms, helping enterprises make fast and accurate decisions in complex market environments . Blockchain technology enhances the transparency and security of the system and ensures the integrity and reliability of data through a decentralized approach .

3. Innovative application of intelligent economic management system

3.1 Data-driven economic decision support

Data-driven economic decision support systems help enterprises make scientific, accurate and efficient decisions in a dynamic and complex market environment by comprehensively using technologies such as data analysis, statistics and artificial intelligence. As shown in Figure 2, the seven key components of data-driven decision-making include leadership, trust, commitment, indicators, data literacy and training. These elements together build a data-driven culture that enables enterprises to transform data insights into practical actions. First of all, leadership plays a vital role in data-driven decision-making. The support and promotion of senior managers are the prerequisites for the successful implementation of data-driven strategies. Trust ensures the accuracy and reliability of data, which is based on a high degree of trust in data sources and analysis results. Enterprises need to have a clear commitment to ensure the smooth implementation of data-driven strategies through continuous investment and resource support . The setting of indicators is an important part of data-driven decision-making. Through quantitative indicators, enterprises can clarify goals and evaluate performance. Data literacy refers to the ability of enterprise employees to understand and analyze data, which is the basis for ensuring that data analysis results can be correctly interpreted and applied. Training is a key measure to improve employees' data literacy and skills. Through systematic training, enterprises can build a team with high data literacy. Ultimately, data-driven decision-making transforms data insights into specific action recommendations through the seven components mentioned above, helping companies achieve more efficient operations and more scientific decision-making.

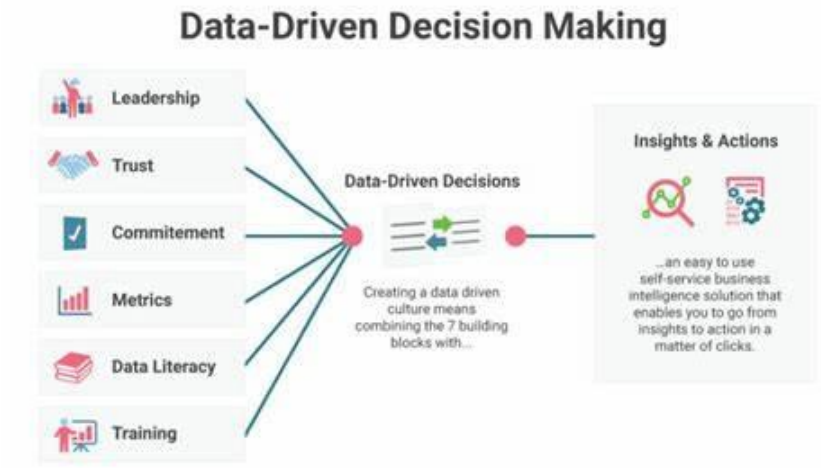

Figure 2 Components of data-driven decision making

3.2 Deep integration of artificial intelligence and economic management

The deep integration of artificial intelligence (AI) in economic management has greatly promoted the optimization of the three major factors of labor, capital and production technology through multiple dimensions such as technology penetration, boundary expansion, knowledge creation and self-deepening, thereby promoting economic growth. Figure 3 shows how AI affects various aspects of the economic management system through different channels. First, technology penetration has enabled AI technology to be widely used in various economic fields, thereby improving overall production efficiency and management level. For example, the application of AI in the financial industry has significantly improved capital utilization efficiency by optimizing investment portfolios and risk management through intelligent algorithms . Boundary expansion refers to the fact that AI technology breaks the boundaries of traditional industries and promotes cross-industry collaborative innovation. For example, the application of AI between manufacturing and service industries has achieved the optimal allocation and utilization of resources through intelligent production and service systems . Knowledge creation is one of the important functions of AI. Through big data analysis and machine learning, AI can extract valuable information and knowledge from large amounts of data to help enterprises make more scientific decisions. Knowledge creation not only improves the competitiveness of enterprises, but also injects new vitality into the entire economic system. Self-deepening refers to the continuous improvement of AI technology's own capabilities and effectiveness in the process of continuous application and development. This process enables AI systems to continuously optimize themselves in complex and dynamic environments through reinforcement learning and adaptive algorithms, thereby achieving more efficient economic management .

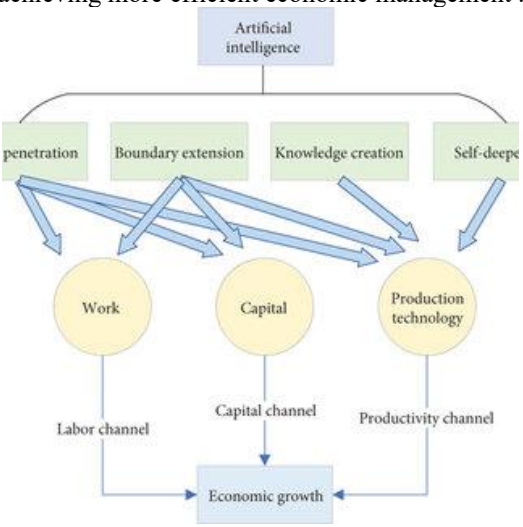

Figure 3 The impact mechanism of artificial intelligence on economic growth

3.3 Innovative applications of blockchain technology in economic management

As a decentralized distributed ledger technology, blockchain technology is profoundly changing all aspects of economic management. Figure 4 shows the core elements of blockchain technology and its various applications in economic management, including wallets, address verification, smart contracts, transactions, trust, networks, cryptocurrencies, ICOs (initial coin offerings), and mining. First, blockchain technology improves data transparency and security in a decentralized manner. Every transaction is recorded on a distributed ledger and verified by all nodes in the network, which effectively prevents data tampering and fraud . This transparency increases trust between parties, especially in financial transactions and supply chain management, significantly reducing intermediaries, transaction costs and time. Second, the smart contract function of blockchain technology makes it possible to automate complex transactions. Smart contracts are self-executing programs embedded in the blockchain that can automatically execute contract terms according to preset conditions, thereby improving the efficiency and reliability of transactions. For example, in areas such as insurance and real estate, smart contracts can automatically execute operations such as compensation and transfer, reducing human intervention and errors . In addition, the application of blockchain technology in the field of cryptocurrency has also promoted innovation in economic management. Cryptocurrencies such as Bitcoin and Ethereum not only provide an alternative to the traditional financial system, but also provide new financing channels for enterprises through ICOs and other means. Mining, as the core mechanism of the blockchain network, verifies and records transactions by solving complex mathematical problems, providing a guarantee for the security and stability of the network .

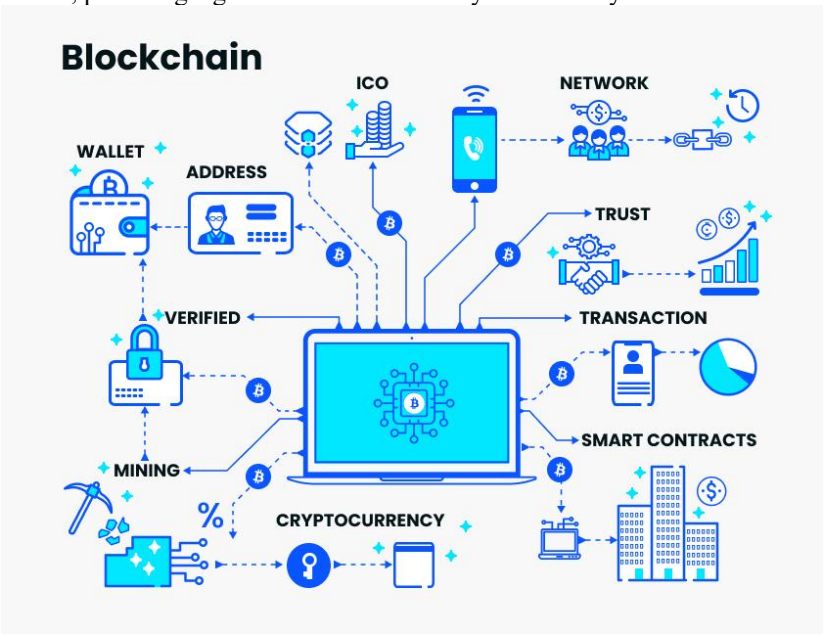

Figure 4 Multiple applications of blockchain technology in economic management

3.4 Future development direction of intelligent economic management system

The future development direction of intelligent economic management systems will be very diverse and full of innovation. First, the continuous progress of artificial intelligence and machine learning technologies will enable these systems to process and analyze massive amounts of data more intelligently, providing enterprises with more accurate decision support. Through deep learning and data mining technology, intelligent systems can identify complex patterns and trends, helping enterprises make more informed decisions in a highly competitive market . Secondly, the combination of the Internet of Things (IoT) and big data technology will greatly enhance the real-time and comprehensiveness of intelligent economic management systems. By collecting data in real time through IoT devices and processing it using big data analysis technology, enterprises can achieve all-round monitoring and optimization of various links such as production, logistics and markets .

4 Conclusion

Comprehensively optimizing and innovating enterprise management, intelligent economic management system is realized by relying on big data analysis, artificial intelligence and blockchain technology. Technological innovation in the field of economic management not only significantly improves its accuracy and response efficiency, but also triggers disruptive progress in the transparency of data disclosure and protection of security. Enterprises relying on the data-driven decision support system are able to more accurately plan resource allocation and achieve operational optimization, thus significantly enhancing their market competitiveness. Companies rely on data-driven decision support systems to plan resource allocation more accurately, optimize operations, and significantly enhance their market competitiveness. At the level of labor, capital and production technology, the in-depth integration of artificial intelligence effectively improves the efficiency of resource allocation, which significantly promotes the sustained and steady growth of the economy, and at the level of improving the transparency of the system and the trust mechanism, the blockchain technology shows its key application value and opens up a new financing path and transaction mode for the enterprises, and with the impetus of the technologies of artificial intelligence, Internet of Things and big data, the future intelligentized Driven by technologies such as artificial intelligence, Internet of Things and big data, the future intelligent economic management system will continue to move towards the development path of intelligence, real-time and personalization.

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