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Research on the Innovative Application of Artificial Intelligence in the Development of E-Commerce in Xinjiang

Li Hua, Wang Wenjie*, Li Mengdi, Huang Yu, Ye Jinhua

Abstracts: The purpose of this paper is to explore the innovative application of artificial intelligence technology in the field of e-commerce in Xinjiang and its impact on regional economic development. Through a systematic review of relevant literature, this paper analyses the current status of the application of AI in e-commerce and focuses on its specific application paths and cases in the development of e-commerce in the Xinjiang region. It is found that AI technology can not only significantly improve the supply chain efficiency and logistics intelligence level, but also promote the intelligent development of agricultural e-commerce and the innovation of e-commerce talent training mode. This paper adopts the method of literature review, comprehensively analyses the existing research results, puts forward future research directions and policy recommendations, and emphasizes the important role of AI technology in promoting the high-quality development of e-commerce in Xinjiang.

Keywords: Artificial Intelligence “E-commerce; Innovation

1 Introduction

As the wave of the digital economy sweeps across the world, China has successively introduced a number of strategic plans to promote industrial innovation.2024 the state in the “Opinions on the Reform and Innovative Development of Digital Trade” clearly put forward to build a new system of digital trade, requiring breakthroughs in the fields of digital product trade, digital service trade, digital technology trade, etc., and focusing on fostering the whole industry chain of e-commerce market players[1].2025 in the “Opinions on the Opinions on the In-depth Implementation of the “Artificial Intelligence +” Action” further emphasises the need to promote the deep integration of artificial intelligence and the real economy, accelerate the transformation and upgrading of the service industry to an intelligence-driven model, and create more intelligent consumption scenarios, especially in the field of living services[2].2025 In the report of the autonomous region’s Department of Commerce and other nine departments on the issuance of the Xinjiang Uygur Autonomous Region to promote the high-quality development of rural e-commerce implementation plan”, it is pointed out that it is explicitly proposed to rely on 5G and IoT technology to transform county commercial outlets, promote the “supply chain transit warehouse + direct broadcasting base” composite industry, lay the foundation for AI algorithms to optimize inventory management and intelligent product selection, and use AI technology to empower the development of e-commerce [3]. The AI technology empowers the development of e-commerce [3].

Under the dual role of policy-driven and technology iteration, e-commerce has become a key engine for regional economic development. In Xinjiang, for example, e-commerce has broken the geographical limitations of this vast land, effectively activating the economic vitality of the frontier. However, due to the complex landscape of “three mountains and two basins”, as well as the high cost of long-distance logistics and transport, the development of local e-commerce has encountered the reality of low time efficiency of logistics and distribution, high operating costs, and slow service response. It is noteworthy that the booming development of artificial intelligence technology has brought light to the dilemma of cracking Xinjiang’s e-commerce. Through the deployment of intelligent customer service system, build personalised recommendation algorithm model, the use of data mining technology, not only can significantly improve the operational efficiency of e-commerce, but also accurately match consumer demand, reshaping the service experience.

2 Current Status of Artificial Intelligence Application in E-Commerce

2.1 Application areas of artificial intelligence technology in e-commerce

2.1.1 Intelligent customer service and after-sales service

Data mining technology builds an intelligent line of defence for risk management of e-commerce platforms by virtue of its in-depth profiling of massive data and pattern recognition capabilities. From abnormal transaction monitoring to risk trend prediction, the application

of this technology effectively reduces operational risks and builds a data security barrier for the long-term stable development of e-commerce platforms.In the process of intelligent upgrading of e-commerce service system, intelligent customer service and after-sales service have become the key breakthroughs to improve user experience. Shu Mei Shu and other scholars (2025) showed that the intelligent customer service system integrating natural language processing and computer vision technology is reshaping the form of e-commerce service by virtue of the functions of multiple rounds of interaction and emotion recognition. Such systems are not only able to respond to customer inquiries in real time, but also accurately capture user needs through semantic analysis, which improves service response efficiency by more than 30% and significantly increases user satisfaction [4]. Xue Qi et al. (2025) further pointed out that in the field of e-commerce logistics service innovation, the construction of intelligent customer service system is crucial. By strengthening language understanding and intent recognition capabilities, the system can quickly analyse user requests, automatically match the optimal solution, and effectively shorten the service processing time [5]. For example, in high-frequency service scenarios such as returns and exchanges, logistics enquiries and other high-frequency service scenarios, intelligent customer service can achieve 7×24-hour uninterrupted service, greatly enhancing the convenience and smoothness of the user experience. The innovative application of intelligent customer service and after-sales service not only provides e-commerce enterprises with technical means to reduce costs and increase efficiency, but also enhances user stickiness through the innovation of the service model, becoming an important engine to promote the high-quality development of e-commerce.

2.1.2 Personalised Recommendation and Precision Marketing

In the wave of intelligent transformation of e-commerce, personalised recommendation and precision marketing have become the core driving force to improve user experience and marketing effectiveness. He Junzhong (2025) pointed out that machine learning, fuzzy logic and convolutional neural networks and other algorithms play a key role in optimising the e-commerce transaction process, and through algorithmic iteration can significantly improve the platform's operational efficiency and security of transactions [6]. For example, the use of deep learning algorithms to analyse user behaviour data can accurately predict consumption trends, laying a technical foundation for personalised recommendations.

Liu Tiantian and Hao Lin (2025) focus on the precision marketing strategy in the era of digital intelligence, emphasising that precision marketing is an important path for e-commerce to break through the traditional model. By building a complete chain of data collection, analysis, and modelling, enterprises are able to gain in-depth insight into user needs and develop targeted marketing strategies [7]. Qian Shuning (2025) further analyses precision marketing from the theoretical level and proposes to build a data-driven innovation model as the core to help e-commerce platforms achieve the transformation from rough marketing to refined operation [8]. Scenario-based marketing based on user stratification can effectively reduce the cost of customer acquisition, improve the user conversion rate and repurchase rate, and enhance the stickiness of users to the platform.

In summary, artificial intelligence technology through the construction of intelligent recommendation and marketing system, not only optimizes the user shopping experience, but also promotes the development of e-commerce in the direction of precision and efficiency, opening up a new path for the sustainable growth of the industry.

2.1.3 Data Mining and Risk Management

In the robust operation system of e-commerce platforms, data mining technology has become a core tool for risk management. He Yubin (2024) shows that by integrating multi-dimensional data such as user behaviour trajectory, transaction flow and commodity information, data mining algorithms are able to construct dynamic risk assessment models. The technology can accurately identify fraudulent transactions, false orders and other abnormal behaviours, and effectively reduce platform operational risks through real-time monitoring and intelligent warning mechanisms [10]. For example, the in-depth analysis of frequent returns, abnormal payments and other behavioural patterns can block potential risky transactions in a timely manner to protect the security of platform transactions.

Xie Fang (2025) pointed out when discussing precision marketing that the preprocessing ability of data mining is a prerequisite for building a reliable risk control system. Through data cleaning, standardised processing and other technical means, it can eliminate noise interference, ensure the authenticity and integrity of data, and provide high-quality data support for subsequent risk identification [9]. This process not only optimises the accuracy of user profiling, but also improves the effectiveness of the risk prediction model, enabling the platform to

lay out prevention strategies in advance.

2.2 Application effect of artificial intelligence technology in e-commerce

Through the deep penetration of the entire chain of e-commerce, artificial intelligence technology has achieved value breakthroughs in core areas such as user experience upgrading, logistics efficiency optimisation and supply chain synergy, and constructed a technical support system for efficient operation. Chen Lixia (2025) pointed out that the anthropomorphic interaction of intelligent customer service, the immersive experience of virtual reality and other technological applications have effectively cracked the traditional e-commerce service response lag, the experience of a single and other pain points, so that the user satisfaction is significantly improved [11]. For example, the AI intelligent body deployed by commercial kitchen equipment enterprises can accurately understand complex inquiries through natural language processing, compressing the customer service response time to 8 seconds, and increasing the reception capacity by 3 times, while driving the conversion rate up by 7%.

In logistics and supply chain, the enabling effect of AI technology is more prominent. Li Tujin (2025) emphasises that the combination of technologies such as data warehouse construction, intelligent demand forecasting, automated warehousing and intelligent distribution promotes the transformation of logistics management from passive execution to active decision-making [12]. Jingdong Logistics "super brain big model 2.0" through the whole link sensing monitoring and optimal resource scheduling, so that the efficiency of front-line operations increased by nearly 20%, and the efficiency of human-machine cooperation strategy optimisation increased by another 20%, confirming the substantial improvement of the effectiveness of the technology on logistics. Nong Liyan and Liu Dongbo's (2025) research on cross-border e-commerce scenarios further shows that AI can not only match consumer demand through accurate recommendation, but also drive the intelligent upgrade of supply chain logistics system to achieve the optimisation of cross-border delivery time and cost control [13].

From front-end experience to back-end management, AI technology is promoting e-commerce from "digital" to "intelligent". Its remarkable results in experience optimisation, efficiency improvement, cost control and other aspects have injected lasting power for the high-quality development of the industry, and also laid a practical foundation for the deep integration of technology and scene expansion.

3 Artificial Intelligence Enabling the Path of E-Commerce Development in Xinjiang

3.1 Status of e-commerce development in Xinjiang

The industrial scale continues to expand, the county economic momentum highlights, Xinjiang e-commerce has formed a large-scale development trend, the annual turnover of the key platform enterprises in 2024 reached 128.310 billion yuan, the registered users exceeded 4500.64 million, and it has become an important growth pole of the "ten industrial clusters" [15]. However, the development of e-commerce in Xinjiang faces four major challenges. In terms of logistics and infrastructure, the wide geographical area and scattered population lead to high logistics costs, the lack of cold chain facilities limits the export of special products, and some remote areas have weak network signals and low penetration of electronic payment. In terms of talent and industrial ecology, there is a lack of high-end operational talents, a disconnect between local talent training and enterprise demand, a lack of supporting service enterprises, and a large gap in core job talents. Brand building is lagging behind, characteristic products are mostly in primary form, lack of national brands, low degree of standardisation, and weak online operation capability. At the level of technology application, AI and other intelligent technologies are only piloted in the head enterprises, small and medium-sized e-commerce enterprises are constrained by funds and talents, and it is difficult to apply intelligent systems, with low levels of operational efficiency and risk prevention and control, and the role of technological empowerment has not been brought into full play.

3.2 Application of Artificial Intelligence Technology in Xinjiang E-commerce

3.2.1 Supply chain optimisation and logistics intelligence

Artificial intelligence significantly improves the supply chain and logistics efficiency of e-commerce in Xinjiang through algorithms and data analysis. He Junzhong (2025) pointed out that IoT technology upgrades promote the development of e-commerce, and algorithms such as machine learning can optimise the transaction process [6]. Li Tujin (2025) showed that AI technologies such as data warehouse and

intelligent prediction can improve the logistics supply chain system and achieve automated warehousing and intelligent distribution [12]. Xue Qi et al. (2025) also proposed that AI can solve the challenges of logistics mileage planning, inventory forecasting, end distribution, etc., and improve the overall operational efficiency, especially suitable for the characteristics of Xinjiang's wide geographical area and complex logistics [5].

3.2.2 Intelligent development of agricultural products e-commerce

In the field of agricultural products e-commerce, AI has become a new engine for rural revitalisation. Fan Chunrong (2025) found that AI can strengthen rural infrastructure, optimise industrial structure, reduce logistics costs and improve quality supervision [16]. Zhou Yan (2025) pointed out from the theoretical level that AI can break through the difficulties in the development of agricultural e-commerce and promote industrial upgrading [17]. Zhang Qiong (2025) takes feed e-commerce as an example and confirms that AI is reshaping all aspects of the industry chain [18].The application of AI not only innovates the sales mode of agricultural products, but also injects new vitality into the rural economy.

3.2.3 Innovation of e-commerce talent training mode

Artificial intelligence promotes the change of e-commerce talent training mode. Yang Yajiao (2025) proposed that the traditional training mode focuses on theory but not innovation, and the new era needs to integrate AI technology into the curriculum to cultivate composite talents [19]. Zhou Jianan et al. (2025) based on the practice of school-enterprise cooperation, through optimising the curriculum system, innovating the teaching mode, and establishing a synergistic mechanism, to create a talent cultivation path that adapts to the new needs [20].The introduction of AI technology provides an innovative direction for e-commerce talent cultivation, and helps to cultivate high-quality professionals.

4 Innovative Application Cases of Artificial Intelligence in the Development of E-Commerce in Xinjiang

In the field of e-commerce, the application can optimise resource allocation and enhance economic efficiency. Mu Yonggu et al. (2025) pointed out that cloud computing, big data, artificial intelligence and other new-generation information technology injects new vitality into e-commerce and promotes its high-quality development [21]; Xia Rong et al. (2025) argued that the construction of an intelligent information management system can provide theoretical support for the sustainable development of rural e-commerce and help the rural economy grow at a high quality level, and at the same time, it can also improve the operational efficiency of the enterprise and market competitiveness [22]; Fang Xie (2025) says that the core of precision marketing is to implement scenario-based marketing based on user stratification, which can reduce customer acquisition costs, improve conversion efficiency, and enhance user stickiness [9]; Tiantian Liu et al. (2025) emphasize the importance of precise positioning Liu Tian et al. (2025) stressed the importance of precise positioning, and precision marketing needs to be dynamically adjusted based on real-time data and the effect of the activity, and further technical optimisation strategies need to be explored in the future. E-commerce logistics service innovation artificial intelligence can promote e-commerce logistics innovation, improve logistics efficiency and service quality [7]; Li Tujin (2025) analysed that the application of AI in data warehousing, intelligent distribution, etc. can promote the sharing of logistics information, optimize the distribution program, reduce costs, improve distribution efficiency, and provide intelligent transformation of logistics support [12].

5 CONCLUSION

5.1 Research Summary

This study focuses on the innovative application of artificial intelligence in the development of e-commerce in Xinjiang to carry out in-depth investigation, and systematically sorted out the current situation of the application of artificial intelligence technology in the field of e-commerce, as well as its specific role in the development of e-commerce in Xinjiang path. The results show that AI technology can not only significantly optimise the level of intelligent customer service and after-sales protection services, but also improve user experience through personalised recommendations and precise marketing, while showing considerable potential in data mining and risk control. Especially in

Xinjiang, the application of this technology is conducive to solving the problems of supply chain optimisation and logistics intelligence, promoting agricultural e-commerce in the direction of intelligence, and helping the innovation of e-commerce talent training mode.

However, there are still some limitations in the current study, such as the lack of in-depth case analysis for specific industries or regions. For this reason, subsequent studies need to further strengthen the empirical analysis, focusing on the actual application cases of different industries to carry out detailed research, in order to more comprehensively explore the application space of AI technology in the development of e-commerce in Xinjiang. In addition, policymaking departments should introduce more incentive policies to promote the popularisation and application of AI technology in Xinjiang's e-commerce sector, thereby accelerating the pace of digital transformation in the region.

5.2 Future Research Directions and Policy Recommendations

In the research on the innovative application of AI to empower the development of e-commerce in Xinjiang, this study systematically reviewed the literature in related fields and analysed the current status of the application of AI technology in the field of e-commerce and its specific impact on the development of e-commerce in Xinjiang. It is found that the application of AI technology in intelligent customer service, personalised recommendation, data mining and other scenarios has effectively improved the operational efficiency and service quality of e-commerce in Xinjiang. However, there are weaknesses in the existing research, such as insufficient research depth on AI technology in supply chain optimisation and intelligent development of agricultural e-commerce.

Based on the above findings, future research can focus more on the practical application of AI technology in supply chain management and agricultural e-commerce, and explore the path to further enhance the overall competitiveness of e-commerce in Xinjiang through technological innovation. At the same time, policy makers need to consider introducing more initiatives to support the development of AI technology, encouraging enterprises to increase R&D investment in the field of AI, and strengthening the cultivation of related professionals to build a solid foundation of talents for the long-term and healthy development of e-commerce in Xinjiang.

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Author's Profile:

Li Hua, Teacher, employed at: Tarim Institute of Technology,research direction: E-commerce.

Wang Wenjie*, Teacher, employed at: Tarim Institute of Technology, research direction: E-commerce.

Li Mengdi, Teacher, employed at: Tarim Institute of Technology, research direction: Agricultural Management.

Huang Yu, Teacher, employed at: Tarim Institute of Technology, research direction:E-commerce.

Ye Jinhua,Teacher, employed at: Tarim Institute of Technology, research direction: E-commerce.

Corresponding Author:

Wang Wenjie*, Teacher, employed at: Tarim Institute of Technology, research direction: E-commerce.