

Research Article

Innovation of E-Commerce Development Model under the Background of Artificial Intelligence and Wireless Communication

Ning Luo 

Finance, Heriot-Watt University, Edinburgh EH144AS, UK

Correspondence should be addressed to Ning Luo; luoning_edu@outlook.com

Received 6 January 2022; Revised 23 February 2022; Accepted 9 April 2022; Published 5 May 2022

Academic Editor: Kalidoss Rajakani

Copyright © 2022 Ning Luo. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

E-commerce refers to the business operation and profit model based on the network environment. Studying the e-commerce model will help to tap the development potential of e-commerce, innovate the content and form of e-commerce, and also help e-commerce companies expand marketing channels and improve sales capabilities. There are many types of e-commerce models, such as BtoB, BtoC, and CtoC, as well as new models such as BtoQ and BtoB. With the development of wireless communications and artificial intelligence, the market scale of e-commerce has gradually expanded, and e-commerce has become a mainstream consumer channel for people. Promoting the development of e-commerce is an issue that e-commerce companies need to pay attention to. This article uses questionnaire surveys and case analysis methods to study e-commerce companies. The results show that the e-commerce market is huge, but the traditional e-commerce model also has a series of problems. It also proposes innovative paths for e-commerce development models, such as logistics acceleration, brand innovation, and payment method innovation, which have important reference significance for the development of e-commerce enterprises. It is suggested that different types of enterprises combine their own comprehensive strength and actual needs to choose e-commerce development strategies suitable for their own development, so as to achieve sustainable development.

1. Introduction

With the development of computer technology, the network scale is getting larger and larger, and people's requirements for information processing and communication equipment are also increasing. Wireless communication and artificial intelligence have been widely used, and many of them are reflected in the research results. Bai Haiming conducted research on the application of wireless communication technology in the Internet of Things in oil fields and proposed that the so-called advanced technology should not be blindly adopted based on the effectiveness of the technology; Li Jing pointed out that the current wireless communication and artificial intelligence technology in agricultural irrigation and specific applications and suggestions for development are put forward.

E-commerce is a product proposed and developed based on electronic information technology, communication tech-

nology, and artificial intelligence theory, a new way of selling. In the boom of e-commerce, both artificial intelligence and communication devices have developed rapidly. There are many theoretical achievements in the research on the e-commerce development model of artificial intelligence decision-making. For example, Kuang said that in recent years, mobile internet, communication technology, and other related information technologies are booming. The distance between merchants and consumers has been greatly shortened, resulting in a new business form. The development of electronic technology and the popularization of information terminals have laid a strong foundation for the continuous improvement of this form [1]. According to Sun and Lu, artificial intelligence based on deep learning has become the driving force for the development of the e-commerce industry [2]. Fang believes that after entering the new century, the coverage of intelligent mobile information terminals among the people in my country has been

increasing, and most people have become accustomed to using intelligent terminals for shopping, and the development of e-commerce has become the trend of the times [3]. Therefore, what this paper proposes is an e-commerce development model based on wireless communication and artificial intelligence decision-making, which is in line with the theme of the times and scholars' research, and has the significance of the times.

This article first studies some basic knowledge of wireless communication. Secondly, the artificial intelligence decision-making is described. Then it analyzes and describes the development, status quo, problems, and strategies of e-commerce. Finally, a questionnaire survey was carried out on the development mode of e-commerce, and the data was obtained.

2. E-Commerce Development Model Based on Wireless Communication and Artificial Intelligence Decision-Making

2.1. Wireless Communication. In the implementation process of the wireless communication network, first of all, the whole system should be planned as a whole, and the appropriate equipment and application software should be selected according to the actual situation. Then, information exchange is realized by rationally arranging parameters such as communication lines, signal frequencies, and data transmission distances between nodes. Finally, resource sharing is accomplished by optimizing the allocation of resources. In addition to the technical field, the development of e-commerce websites should also pay attention to the following issues: The first is to take customer service as the main target. The second is to provide users with good convenience and security and at the same time to meet the needs of the customer's use environment [4, 5].

The architecture and use of wireless communication networks involve many elements. Of these elements, data transmission and processing are the most important.

A series of processes from information collection and communication control to sending signals all need a reasonable technology to achieve, due to the low cost and low power consumption of wireless devices. For some small mobile phones, it is one of the more suitable wireless communication network systems for real-time and very high power consumption. It can avoid the degradation of communication performance and efficiency caused by long-term use to a certain extent of impact [6, 7].

In the implementation process of wireless network, we need to continuously optimize and improve it so as to meet the needs of users. This problem is mainly analyzed from two aspects. The first is from a technical point of view. The first is to improve the ability of independent development, and the second is to consider how to reduce costs from an economic point of view. The second is to optimize and improve the system [8, 9]. For a complete and mature enterprise, it is impossible to completely replace a form of resource integration that exists independently in the production process. Therefore, we can achieve sufficient informa-

tion resource support for all work units by analyzing the existing equipment. At the same time, it should be adjusted or changed according to customer needs, so that it can meet the requirements of different types of users [10, 11].

2.2. Artificial Intelligence Decision. Artificial intelligence and big data algorithms are the two cornerstones of e-commerce development at the technical level. At the same time, the relationship between the two is also very close. Only when the development level of the two is matched can e-commerce make corresponding progress at the technical level. Intelligence is a complex system engineering that needs to be operated and analyzed with the help of the human brain to achieve its functional requirements and to successfully complete the corresponding tasks. For this, the robot in virtual reality can be used to simulate the required data and make decisions [12, 13].

Under the traditional business model, the improvement of enterprise management efficiency is often constrained by information asymmetry and other aspects, resulting in the slow development of many enterprises. And intelligent decision-making can solve these problems. With the continuous progress of society and the improvement of the level of science and technology, as well as the accelerated pace of people's life and the rapid popularization of Internet technology, the growth of a large amount of data has made a large amount of data stored and become a valuable user. At the same time, due to the increasing demand for e-commerce platforms, the number of online shopping users has increased dramatically, resulting in new information flow, logistics, and capital flow [14, 15].

Intelligent decision-making is to use existing knowledge and experience to make analysis and judgment. The intelligence in the e-commerce mode mainly includes the following aspects: The first is the collection and management of customer information data. The second is from the integration of internal resources of the enterprise to the optimization of the external market environment to the optimal resource allocation of the entire supply chain process. The third aspect is to grasp the overall situation as a whole, so as to make the most reasonable and effective plans and measures [16, 17].

Through the statistics and processing of large amounts of data, artificial intelligence transforms it into computable, understandable, and real-time learning and finally obtains the required information. Use the computer as the basic platform to collect all kinds of massive data information resources. In this process, it is necessary to continuously update the knowledge base content and method structure. Use network technology to achieve the characteristics of strong interaction with users. The results obtained by analyzing and processing a large number of data samples are simulated and then applied to practical work [18].

The current development of e-commerce is closely related to fuzzy theory, which can be defined as:

$$F = \{(\lambda, \mu), \eta(\lambda, \mu) \mid Y_\lambda \in A, Y_\eta \subseteq [0, 1], 0 \leq \eta(\lambda, \mu) \leq 1\}. \quad (1)$$

If the domain A is continuous, the type-2 fuzzy set can also be expressed as

$$F = \int_{\lambda \in A} \int \eta(\lambda, \mu) / (\lambda, \mu). \quad (2)$$

This kind of dataset belongs to the upgrade of upstream and downstream datasets in the hierarchical field, so it can realize the integration and unity of related data in terms of content, so as to describe the characteristics of e-commerce more accurately [19–22].

With the development of e-commerce so far, the role of artificial intelligence cannot be ignored. It links the development of information technology with the judgment of consumers' needs and can also store data in a computer system in various forms and can provide services and other functions according to user requirements [23–26].

2.3. E-Commerce. From a macro perspective, e-commerce is no longer limited to the commercial field. It is not only closely related to the development of information technology, but also inextricably linked to finance, law, and other aspects. On the microlevel, e-commerce has changed the traditional business format with the help of information technology, and it has brought about changes that cannot be ignored for the entire commodity circulation chain [27–29].

2.3.1. Development Level of E-Commerce. The progress of e-commerce is based on the application of network technology in this field. The rapid progress of information technology has driven the continuous improvement of e-commerce. All units in the business development chain have achieved direct contact through the Internet, which has greatly changed the definition of business operations [30–32]. At this stage, almost all economies take e-commerce as an important development point. E-commerce has also paid off in terms of employment, economic vitality, and more. However, due to its high dependence on the level of information technology, the level of e-commerce in many developing countries is at a lower level, and they have serious deficiencies in security and consumer demand analysis.

2.3.2. The Basic Characteristics of E-Commerce: As a new type of transaction method, e-commerce has the following basic characteristics:

(1) *Universality.* In real life, it quietly affects our production and way of life. And showing the characteristics of the diversification of subjects, almost all kinds of units and individuals have the qualifications to become the main body of e-commerce.

(2) *Convenience.* People can easily transact no matter where they are in the electronic transaction process. Since the transaction method of e-commerce adopts electronic payment, in theory, as long as it is an area covered by the Internet, effective transactions can be carried out. This method converts traditional forms of money into digital information, greatly increasing the speed of transactions.

(3) *Integrity.* It can effectively integrate human operation and information processing, make full use of various human and material resources, and improve the integrity of the system.

(4) *Coordination.* Its development requires the cooperation of multiple departments.

(5) *Security.* Security is the most important aspect when conducting transactions. And this is one of the important factors hindering the rapid development of e-commerce.

2.3.3. Common Problems of E-Commerce. Strictly speaking, the problems faced by the e-commerce levels at various stages are also very different. But on the whole, the common problems in the development of e-commerce are as follows: enterprises cannot match their actual needs and capabilities when developing e-commerce levels, the development of supporting logistics construction is slow, and the security of electronic payment cannot be effectively guaranteed.

2.3.4. Classification of E-Commerce models

(1) *Classification by Transaction Type.* Under the e-commerce mode, the extension of transactions has been greatly expanded, and many new electronic transaction modes have emerged one after another, which has become an important basis for dividing e-commerce modes. However, we can still find the prototype from the traditional trading model, such as direct and indirect trading, whether the traded goods are physical or virtual goods and so on.

(2) *Classification According to the Identity of the Transaction Subject.* At this stage, the participants of e-commerce can be divided into 9 main categories. But in fact, the identities of these subjects are often intertwined. For example, brokers can hold other positions, and they can be further subdivided according to their professional content, such as B2B and B2C which are common classifications based on the identity of the transaction subject at this stage.

(3) *According to the Classification of Business Functions.* E-commerce models are divided into three categories: business models based on product sales, business models based on sales services, and business models based on providing information.

2.3.5. Comparison of Business Core and Income Source of E-Commerce Model. Even in the mode of e-commerce, the success of the transaction cannot be separated from the two important aspects of products and services, which are the core values of the transaction. Therefore, the specific business core and revenue sources are shown in Table 1:

2.3.6. Model Design of Mobile Business Intelligence System. Data warehouse modeling generally adopts data-driven design methods. The specific steps are shown in Figure 1:

TABLE 1: Comparison of business core and income sources of e-commerce model.

E-commerce model	Business core	Main benefits and sources of income
E-shop	Online sale	Increase in sales and decrease in costs
E-procurement	Online purchase	Reduce costs
Electronic mall	Rent online shop	Rent, management fee
E-auction	Online auction	Auction fee, management fee, auxiliary fee
Virtual community	Establish and manage online communities	Membership fee, advertising fee
Collaboration platform	Rental online platform	Rent, management fee
Third-party market	Build and manage website	One-time fee, consulting fee, management fee
Value chain integrator	Integrated value chain	Integration implementation fee, consulting fee
Value chain service provider	Provide value chain services	Service fee, consulting fee
Information broker	Provide information services	Service fee, advertising fee
Credit service	Intermediate credit service	Service fee, advertising fee, consulting fee

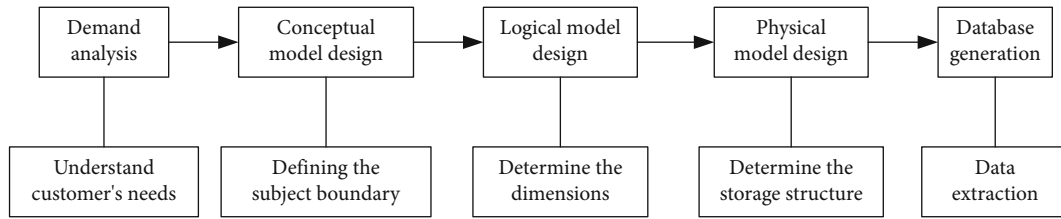


FIGURE 1: Data warehouse design process.

3. Questionnaire Survey on E-Commerce Development Model

3.1. *Investigation Background.* E-commerce has a history of more than ten years in my country, especially in recent years, it has experienced a stage of rapid development and has become an indispensable and important part of social and economic life. But compared with the traditional business model, its immaturity is manifested in many aspects. Especially behind the rapid development, there are many great problems to be solved. Due to people’s increasing demand for it and increasingly fierce competition, the drawbacks of e-commerce are constantly exposed. It requires us to actively explore and find effective countermeasures suitable for its development. In order to adapt to the trend of the times and social needs and to survive better and obtain more potential customer resources and greater profit space, it is necessary to develop a new business operation method to promote the development of e-commerce.

3.2. *Questionnaire Design.* This questionnaire mainly focuses on some understandings of e-commerce and some suggestions for the development of e-commerce. The questions covered by the questionnaire mainly consist of the following aspects:

- (1) Understanding of e-commerce
- (2) Have you used e-commerce related applications?
- (3) What problems do you think e-commerce still has?
- (4) How to develop e-commerce?

TABLE 2: The scale of Chinese Internet users and Internet penetration rate.

	Netizen size	Growth rate (%)	Penetration rate (%)
2016	7.29	3.18	51.18
2017	7.68	3.47	55.77
2018	8.32	3.79	57.66
2019	8.81	4.06	61.38
2020	9.37	4.65	67.12

3.3. *Investigation Process.* This article first designed the questionnaire and invited 10 people to answer the questionnaire for the first time. Then select and redesign questions based on the answers of 10 people. Then print out 100 questionnaires and invite passersby to answer the questions with rewards. After one week, 100 questionnaires were filled out, and statistical analysis was carried out. In the end, 98 questionnaires were collected effectively, and the effective response rate reached 98%.

4. Analysis of Survey Results

4.1. *Internet Penetration Rate in China.* The actual results of the popularity of China’s Internet based on online network searches and questionnaires are mainly analyzed from the number, growth rate, and penetration rate. This paper selects the network scale data of the past five years, as shown in Table 2:

As shown in Figure 2, netizens can see that with the growth of the years, the number of netizens is also increasing.

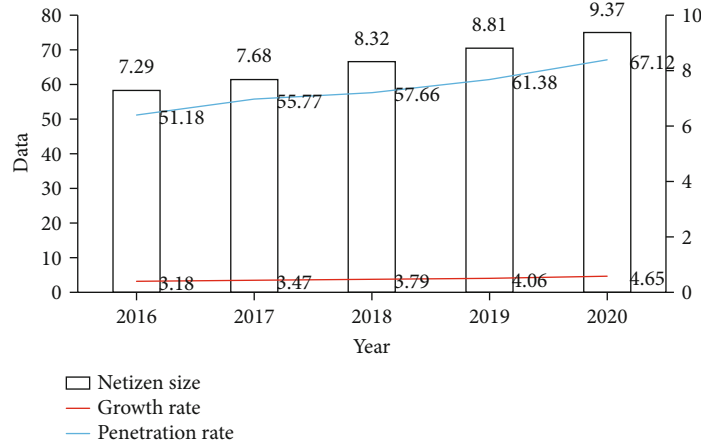


FIGURE 2: The scale of Chinese Internet users and Internet penetration rate.

Among them, by 2020, the number of Internet users in China will reach 940 million, and the Internet penetration rate will reach 67%. In addition, the growth rate also continues to rise with the increase of the year.

4.2. *Problems in E-Commerce.* Analyze the problems of e-commerce based on the content of the questionnaires filled in by passersby and the actual situation. We can know that e-commerce still has the following problems: environmental conditions are not yet mature, security is not high, funding problems, logistics problems, and electronic payment problems. The specific situation is shown in Table 3:

As shown in Table 3, we can see that the development environment of e-commerce is good, but the problem of regional imbalance in the development of e-commerce is more serious. Secondly, e-commerce still has the problem of low security, so the development of e-commerce can improve the privacy of netizens and the security of funds.

4.3. *The Development Direction of E-Commerce.* According to the content of the questionnaire, some e-commerce developments proposed by passersby need to pay attention to the following aspects: market research, service outsourcing model, brand and technological innovation, enterprise division of labor and cooperation, logistics enterprise model, etc. The details are shown in Table 4:

As shown in Figure 3, we can find that 12 people attach great importance to logistics. Secondly, they agree with the division of labor and brand innovation. In addition, a small number of people do not pay much attention to market research and so on. For the development of e-commerce, market research, service outsourcing model, brand and technological innovation, enterprise division of labor and cooperation, and logistics enterprise model are all important links.

4.4. *E-Commerce Development Strategy*

4.4.1. *Suggestions for the Development of Cross-Border E-Commerce.* In recent years, my country’s cross-border e-commerce industry has achieved rapid development, but it is still a primitive transaction model. In order to achieve better development, the most efficient way at this stage is to

TABLE 3: Problems in e-commerce and attitudes towards problem.

	Good	General	Bad
Environmental conditions	9	11	5
Safety	5	7	8
Funds	7	6	5
Logistics	8	5	4
Pay way	6	11	4
Regional	3	6	7

TABLE 4: The development direction of e-commerce.

	Agree	Does not matter	Disagree
Market research	10	4	3
Service outsource	10	6	4
Brand and technological innovation	11	7	7
Division of labor	11	5	6
Logistics enterprise model	13	7	6

strive for cooperation with international cross-border e-commerce. And this requires us to pay attention to the cultivation and mining of talents in related fields, do a good job in the research of the target market, improve the technological addition and quality reputation of the brand, and realize the upgrade of cross-border e-commerce business.

When enterprises implement e-commerce, the choice of business model is a key issue. E-commerce models require continuous innovation. Building a typical business model often requires identifying elements of the business value chain. Which of these elements have the greatest impact on profitability and added value, companies should focus on these factors when building their e-commerce model.

4.4.2. *Suggestions on the Development of E-Commerce for Large Enterprises.* Enterprises can choose the trading platform and click to enter. Apply for free registration and make simple enquiries. Often, e-commerce sites have a blank

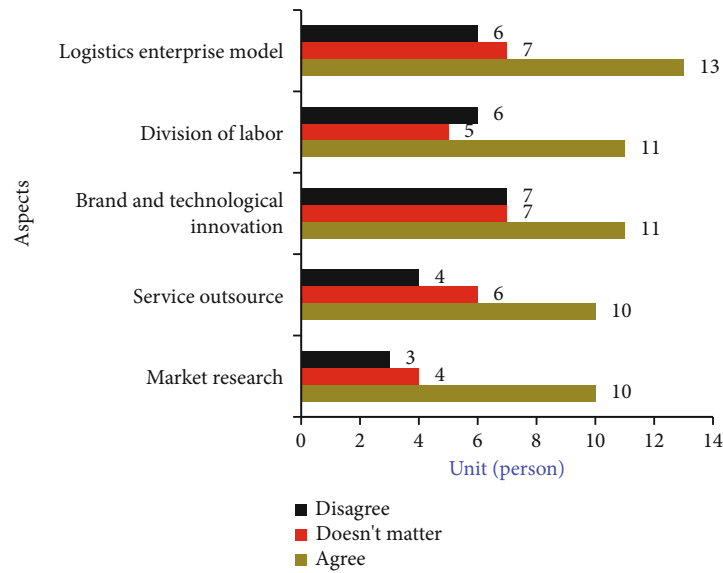


FIGURE 3: The development direction of e-commerce.

section where new members of the site can search for information about the supply and demand of the business. If you want to know more information, for example, business contact information abroad or other value-added services, you must submit a payment request and register as a full member. Then use the contact information to contact the requesting party directly. Large enterprises with strong financial resources can set up their own websites on the Internet to provide customers with comprehensive information, including product specifications and quality and classification, as well as perfect after-sales service.

4.4.3. Suggestions on the Development of E-Commerce for Small- and Medium-Sized Enterprises. The comprehensive strength of small- and medium-sized enterprises is relatively limited. In the development of e-commerce, the strategy of “warming the group” can be adopted. For example, in the field of logistics construction, which requires huge investment, for consumers in the same city as traditional transportation companies that have cooperative relations, third-party logistics companies such as “Same City Express” will deliver goods from the inventory of traditional transportation companies to customers. For consumers in other regions, based on the principle of proximity, traditional consumer-oriented distribution companies are arranged to deliver products to customers by mail. Regarding the ownership of the goods, the enterprise only has the ownership of the goods at the time of shipment. The third-party logistics company has the obligation to protect the goods during transportation and is responsible for delivering the goods to consumers in good condition.

5. Conclusion

Artificial intelligence is an interdisciplinary science, involving fields such as natural sciences, social sciences, and biotechnology. In this complex and challenging research,

intelligent decision-making is a very important and meaningful learning discipline. The development of artificial intelligence is of great significance in the field of e-commerce. The design of intelligent e-commerce decision-making can make its sales method more convenient. This research adopts the method of questionnaire survey, grasps the public’s cognition of e-commerce development at this stage, and sorts out the strategies of various types of enterprises to develop e-commerce according to their opinions. The results of the questionnaire survey in this article show that there are more and more Internet users, and the environment for e-commerce development is good, and in-depth research on logistics is needed. In the following research, I will illustrate and analyze the current situation of e-commerce development in specific enterprises or regions through case analysis, hoping to draw more targeted development strategies.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

It is declared by the author that this article is free of conflict of interest.

References

- [1] Y. C. Kuang, “Research on mobile e-commerce business models based on smart terminals,” *Chinese Market*, vol. 55, no. 41, pp. 114-115, 2016.
- [2] K. Sun and Z. L. Lu, “Research on the application development trend of artificial intelligence in e-commerce,” *Guizhou Social Sciences*, vol. 61, no. 9, pp. 136-143, 2019.

- [3] F. Fang, "Research on mobile e-commerce marketing model based on smart phones," *E-commerce*, vol. 49, no. 4, pp. 63–64, 2020.
- [4] S. G. Ma and H. X. Song, "Research on countermeasures for the development of cross-border e-commerce enterprises driven by artificial intelligence," *Business Economics*, vol. 531, no. 11, pp. 161–163, 2020.
- [5] M. L. Liu and J. Wang, "Research on the integration path of artificial intelligence technology and cross-border e-commerce talent training," *Market Modernization*, vol. 892, no. 7, pp. 65–66, 2019.
- [6] C. Q. Xiao, "Research on the characteristics, status quo and trend of the intelligent development of e-commerce," *Market Modernization*, vol. 924, no. 15, pp. 39–42, 2020.
- [7] C. Wang and W. G. Guo, "Research on the development countermeasures of Anhui agricultural products E-commerce based on O₂O model," *Rural Practical Science and Technology Information*, vol. 22, no. 11, pp. 14–17, 2019.
- [8] B. Li, G. Xiao, R. Lu, R. Deng, and H. Bao, "On feasibility and limitations of detecting false data injection attacks on power grid state estimation using D-FACTS devices," *IEEE Transactions on Industrial Informatics*, vol. 16, no. 2, pp. 854–864, 2020.
- [9] C. Mi, J. Chen, Z. Zhang, S. Huang, and O. Postolache, "Visual sensor network task scheduling algorithm at automated container terminal," *IEEE Sensors Journal*, vol. 22, no. 6, pp. 6042–6051, 2022.
- [10] L. Huang, "A preliminary study on artificial intelligence and E-commerce management," *Marketing Circle*, vol. 43, pp. 233–234, 2019.
- [11] K. Y. Yang, "Research on cross-border e-commerce logistics optimization based on artificial intelligence technology," *Modern Economic Information*, vol. 12, pp. 372–372, 2019.
- [12] X. Ju, C. Fan, M. Wang, and R. Li, "Discussion on the application of artificial intelligence in e-commerce," *Electronic Commerce*, vol. 10, pp. 21–22, 2020.
- [13] G. Zhu, Z. Zhu, Y. Zhu, and H. Ge, "Theory and case analysis of cross-border e-commerce logistics system construction under the background of artificial intelligence," *Logistics Engineering and Management*, vol. 40, no. 11, pp. 31–35, 2018.
- [14] E. G. Zhao, "Research on the integration of e-commerce and artificial intelligence technology," *China Science and Technology Information*, vol. 23, pp. 115–116, 2017.
- [15] S. S. Zhu, S. X. Yang, and N. Qiu, "Research on artificial intelligence to promote the development of smart logistics," *Science & Technology Information*, vol. 17, no. 25, pp. 246–247, 2019.
- [16] Z. Lin, "Research on the development path of E-commerce in the "Internet +" era," *Modern Marketing (Late Period)*, vol. 10, pp. 110–111, 2020.
- [17] L. Wu, "Research on the "Smart+" e-commerce innovation and entrepreneurship training model of college students using visual internet technology in 5G environment," *Computer Knowledge and Technology*, vol. 16, no. 24, pp. 239–241, 2020.
- [18] J. H. Lin, "Analysis on the application of artificial intelligence technology in the field of e-commerce," *China Business Forum*, vol. 45, no. 2, pp. 19–20, 2019.
- [19] Y. Q. Zhu and N. Tang, "Analysis of the current situation of Suzhou cross-border e-commerce export logistics," *Industry and Technology Forum*, vol. 21, no. 3, p. 2, 2022.
- [20] F. H. Lv, "Analysis of marketing channel integration in e-commerce environment," *Business 2.0 (Economic Management)*, vol. 2, no. 3, 2022.
- [21] H. Zijing, "Overseas live-streaming e-commerce companies are actively testing the tide," *Chinese and Foreign Toy Manufacturing*, vol. 1, p. 2, 2022.
- [22] Y. Wang, "'Internet +" rural e-commerce development strategy," *Cooperative Economy and Technology*, vol. 2, p. 3, 2022.
- [23] X. Lin, C. Xiong, and L. Jian, "Exploration on the training mode of e-commerce professionals based on the background of innovation and integration-taking the Guangdong Ocean Engineering Vocational and Technical School as an example," in *Vocational Education*, vol. 1, no. 2, 2022Guangdong Education, 2022.
- [24] J. Wang, "Reflections on the marketing of retail industry in the e-commerce era," *China Business Theory*, vol. 1, p. 3, 2022.
- [25] J. W. Rao, "Research on the marketing mode of agricultural products in the e-commerce era," *Shanghai Business*, vol. 1, p. 2, 2022.
- [26] S. S. Cao, "The application of e-commerce in the marketing of small and medium-sized enterprises," *Time-honored Brand Marketing*, vol. 1, p. 3, 2022.
- [27] K. J. Li and L. S. Liu, "Thinking about the orientation of e-commerce professionals training," *Shanghai Business*, vol. 1, p. 3, 2022.
- [28] J. L. Wang, "Research on precision marketing of e-commerce enterprises under the background of big data," *The Economist*, vol. 1, p. 3, 2022.
- [29] Y. Lei, H. Cao, H. Zeng et al., "Terahertz wireless communication technology for future large-capacity communication," *Telemetry and Remote Control*, vol. 42, no. 6, p. 24, 2021.
- [30] J. M. Liu, "Key technologies and development status of 5G wireless communication," *China New Communication*, vol. 23, no. 6, p. 2, 2021.
- [31] J. C. Chen, "The impact of 5G mobile wireless communication technology on the development of the Internet of Things industry," *Electronic Technology and Software Engineering*, vol. 15, p. 2, 2021.
- [32] L. Q. Zhang, "Research on the application of ZigBee wireless communication technology based on the era of tea culture," *Fujian Tea*, vol. 43, no. 1, p. 3, 2021.