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Retraction

Retracted: Personalized Recommendation Evaluation of Credit Degree Based on New Hybrid Crow Search Algorithm for E-Commerce Live Industry Data Analysis

Journal of Sensors

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Manipulated or compromised peer review

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] Y. Ma, "Personalized Recommendation Evaluation of Credit Degree Based on New Hybrid Crow Search Algorithm for E-Commerce Live Industry Data Analysis," *Journal of Sensors*, vol. 2022, Article ID 6023031, 11 pages, 2022.

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Research Article

Personalized Recommendation Evaluation of Credit Degree Based on New Hybrid Crow Search Algorithm for E-Commerce Live Industry Data Analysis

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With the advent of the era of national live broadcast, the "live broadcast + e-commerce" model reconstructs "people, goods, and fields", and merchants, platforms, and anchors create a new marketing system around consumers' perceptions, attitudes, and emotions to enhance consumer willingness. E-commerce live broadcast ultimately brings back the core of marketing, according to retailers. The psychological contract in the live broadcast is a variable, and its commitment or breach will have an effect on the consumer attitude and consumer emotions. From the perspective of the consumer, stronger consumption motivation, content quality, Netflix charm, trust, and highly interactive consumer expectations must exist. Based on the above background, the understanding of business infrastructure in the digital economy era should also be dynamically adjusted in conjunction with the concept of new infrastructure and business innovation practices. This paper investigates personalized recommendation assessment of credit degree based on data analysis of the live e-commerce industry based on new hybrid crow search algorithm in this context, delves into the state of e-commerce in China today, offers a profound discussion on e-commerce as well as credit degree, and concludes the paper with a general summary.

1. Introduction

With the arrival of the era of national live broadcast, the "live broadcast + e-commerce" model reconstructs "people, goods, and fields", and merchants, platforms, and anchors create a new marketing system around consumers' perceptions, attitudes, and emotions to enhance consumption willingness. From the perspective of merchants, e-commerce live broadcast ultimately to return to the essence of marketing. From the consumer's point of view, driving consumer behavior to live consumption is bound to have a stronger consumer motivation, content quality, Netflix charm, trust, and a high degree of interaction reflected in the consumer expectations and constitute the psychological contract in the live broadcast; as a variable, its commitment or breach will have an impact on the consumer attitude and consumer emotions. From the psychological contract, "live streaming + e-commerce" is not only a technical paradigm but also a personalized and emotional marketing model [1].

According to actual trends, the development of new commercial infrastructure has received significant attention in recent years from the federal government, the provinces, the cities, and the businesses themselves [2]. At the national level, the State Council of the CPC Central Committee has implemented a new "double cycle" development strategy, as well as policies and measures on reforming the consumption and circulation system and building new infrastructure that take into account the needs for building new business infrastructure. At the provincial and municipal levels, many provinces and cities have laid out new business infrastructures from different perspectives, focusing on the cultivation of economic dynamics [3]. At the enterprise level, from Alibaba relying on the advantages of e-commerce development of the "box horse fresh-sang" new retail to Tencent relying on social traffic extension of business services, and Meituan relying on super platform links to local life, and then to Jindong Logistics and Shunfeng Group focus on building an integrated supply chain logistics service system, and then

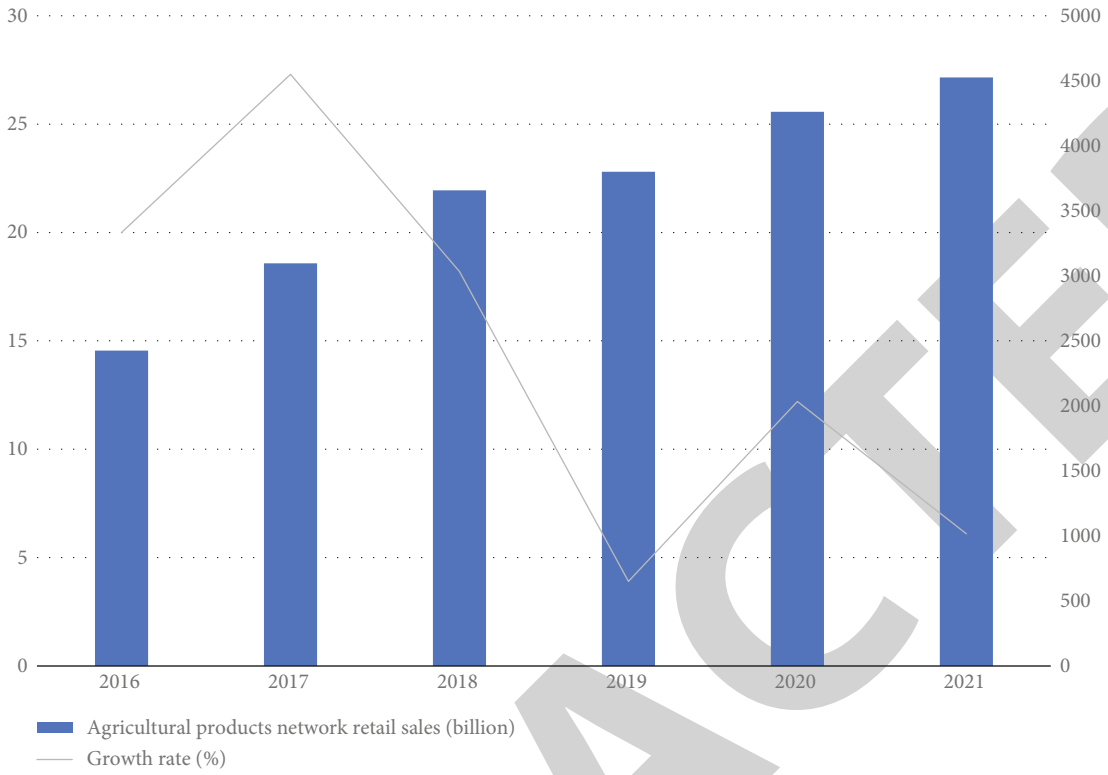

Figure 1: Statistics on the scale of agricultural products e-commerce transactions in China from 2016-2021.

to live broadcast platform such as Juchang, Racer evolved into live e-commerce. Meanwhile, the development of live e-commerce and community group purchase in the prevention and control of the new crown epidemic in 2020 has demonstrated the important role of digitization-centered new business infrastructure construction, and the pressure to maintain supply brought by the multipoint epidemic distribution in 2022 has further highlighted its critical role [4].

Due to the scale of agricultural e-commerce transactions, as depicted in Figure 1, this paper investigates the personalized recommendation assessment of credit degree based on the new hybrid crow search algorithm [5].

2. Research Background

The digital economy has impacted every aspect of the Chinese economy and people's lives, and new technologies, business models, and modes of communication are thriving thanks to the growth of e-commerce platforms [6]. With its attribute that "everything can be broadcast, everyone can be broadcast, and everywhere can be broadcast," live e-commerce has quickly emerged as a new hot spot in e-commerce and consumption [7]. Live e-commerce is rapidly changing people's shopping and consumption habits, becoming a new marketing model for e-commerce sales, making live broadcast a new windfall and development mode for e-commerce, and becoming the focus of competition in various industries [8]. Live e-branding, commerce's clustering, and specialization traits have been discussed. A new opportunity for the entity industry has emerged as the study claims that the total scale of China's live e-commerce industry reached 433.8 billion RMB in 2019, and that the number of online live users in China reached 526 million in 2020. The study also claims that the industry's scale has approached a trillion dollars in volume and will reach two trillion dollars by 2021. The live streaming fever in China has not only made the use of live streaming to make product sales more widespread in its own country, but the fever has also spread around the world, throughout Europe, America, and Southeast Asia [9]. The soaring e-commerce live streaming craze in China has inspired e-commerce companies in Southeast Asia and some European and American countries. The outbreak of the epidemic in 2020 made traditional cross-border companies face pressure from logistics, supply chain, capital and other aspects, traditional offline foreign trade channels were frustrated, and the popular live streaming with goods in China began to go abroad, which led to the initial development of cross-border live streaming, a surge in traffic data of major cross-border e-commerce platforms, and a qualitative change in the shopping habits of overseas consumers [10]. The success of the 2020 China Canton Fair has further promoted the forward development of cross-border live streaming, and more international cross-border e-commerce platforms have aimed at the windfall and joined the live streaming army [11]. By March 2021, the growth rate of online sales in the United States is 48%, in which a large increase is live streaming with goods. Since all market behaviors have cultural boundaries and the political and cultural characteristics of a nation or country at a given time largely determine the consumer behavior and

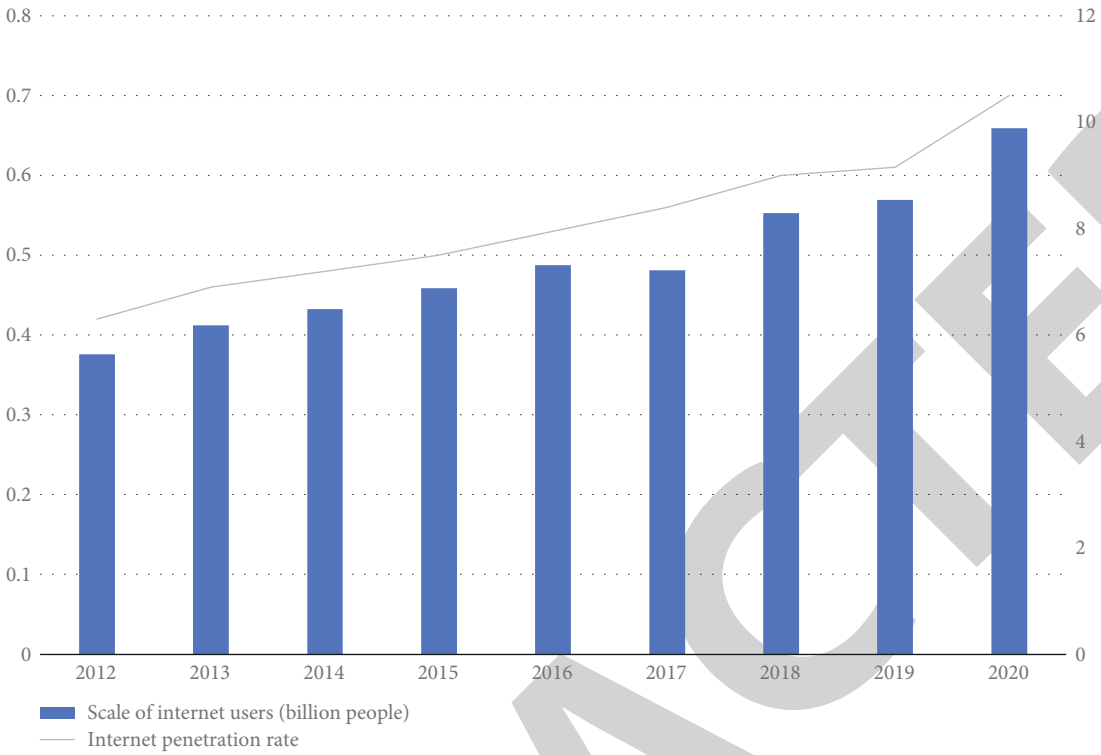

Figure 2: Scale of Internet users and Internet penetration rate in China from 2012 to 2020.

business model of that nation or country at that particular time, the development of cross-border e-commerce must always contend with this cross-cultural marketing dilemma [12]. Therefore, increasing cultural sensitivity and awareness is crucial for the growth of international e-commerce. The size of Chinese Internet users and Internet penetration rate from 2012 to 2020 is shown in Figure 2.

This study aims to analyze the effects of cross-border live streaming on the effectiveness of market promotion from a cross-cultural perspective when targeting different countries and regions because, when combined with the local native culture, consumer behavior is influenced by culture [13]. This study also aims to identify the changes and impacts caused by the application of live e-commerce to the general economic environment of cross-border e-commerce platforms. In order to practice a live broadcast mode that can increase the marketing effectiveness of each country under the influence of localization factors, use new media marketing to promote the development of cross-border e-commerce, promote the quality and upgrade of digital consumption, and build a sustainable business; it is necessary to identify the characteristics and features of the cross-border cross-cultural characteristics of the live broadcast operation mode of multinational e-commerce platforms.

In the context of the global has stepped into the era of digital economy, digital economy as a new form of economy with rapid development, extensive radiation, and active innovation [14]. The impact of the new crown pneumonia epidemic has made the advantages of digital trade gradually emerge. The digital economy, as the future development pattern of the world economy, has reshaped the development direction of the world economy, impacted the direction of the international economic and political system, and set off changes in finance, trade, technology, security, and other aspects [15]. While cross-border e-commerce as a cross-border and cross-cultural business activity, the impact of cultural distance on business activities is still inevitable, and although the application of Internet and digital technology has diluted the differences in space and time, cultural differences are still the main factors affecting cross-border business. Cultural factors play a key role in consumer behavior and psychology to the extent that they influence consumption outcomes and consumer trends [16]. Therefore, actively integrating and correctly understanding different local cultures around the world and actively exploring cross-cultural operation strategies and approaches that are in line with efficient cross-border e-commerce platforms are also inevitable paths for the sustainable development of cross-border e-commerce.

3. Materials and Methods

3.1. Basic Theory

3.1.1. Live E-Commerce. Due to the Internet's widespread use, the world's trade and economy are now closely intertwined. Additionally, as e-commerce has grown quickly, so have the number of e-commerce businesses, leading to the vigorous development of the e-commerce platform. E-commerce platforms offer greater ease of communication

between businesses across borders when compared to traditional trade methods, to the point where they better encourage the formation of transactions between buyers and sellers and significantly increase the trade volume of foreign trade enterprises [17]. A foreign scholar elaborated that e-commerce platforms provide a sales platform for different enterprises to enter the global market, and the relationship between both e-commerce platforms and enterprises that sell online through e-commerce platforms brings many challenges to enterprises. Market operation is a crucial component of business development and is also crucial for the growth of cross-border e-commerce, according to a Shaanxi scholar. Only by maximizing the role and value of market operation can the long-term and smooth development of e-commerce enterprises be ensured [18]. According to a research team from Peking University, cross-border e-commerce has a business model that is constantly evolving and new compared to traditional domestic e-commerce. The market structure and business model of domestic e-commerce platforms are comparatively stable, but the competitive and quickly evolving international market will cause some of the businesses that were moving abroad to be eliminated by the market while also sparking the emergence and development of new business models. Small and medium-sized foreign trade enterprises are currently experiencing some phenomena and problems with the development of cross-border e-commerce. According to some scholars in Hongshan, these issues include uneven product quality, poor cross-border logistics, and insufficient operational capacity, all of which have an impact on the future growth of cross-border e-commerce [19]. Also present on the e-commerce platform are the live banding trend, commodity centralization, and diversification of model subjects. Cross-border e-merchants should improve the security and convenience of the platform by optimizing the platform design and continuously improve the quality of the products in order to significantly improve the platform's overall competitiveness; according to some studies that have found that the quality of the products and the security and convenience of the platform are the key factors affecting the operation of cross-border e-commerce platforms at present. The use of new media for content promotion and dissemination can more effectively increase the visibility of e-commerce platforms, so a study exploring the background of the new media marketing model that is gradually replacing the traditional network marketing model has found that new media marketing has become an unavoidable trend of the future development of e-commerce platform operation. For the future development of the e-commerce platform, the organic fusion of new media marketing and platform operation will present countless opportunities and challenges.

The widespread use of live streaming for goods by e-commerce platforms assisted by mobile communication technology and Internet applications has resulted in the creation of a brand-new economic structure known as the "live economy." According to some researchers, using e-commerce platforms for live streaming merchandise has greatly benefited both platforms and merchants, and platform transactions have been rising, making the live streaming economy a common sales model at the moment. According to other researchers, live webcasting of products is a growing business model that employs live streaming technology to show products online in real time, assist customers in making purchases, and respond to customer inquiries locally [20]. The explosive growth of live streaming with goods has given economic development new impetus and continues to do so based on its features of good value and high interactivity. This is due to the rapid popularity of mobile Internet. According to some studies, e-commerce live marketing will become more professional and standardized in the future with the innovative development of AR and VR technology and the further popularization of 5G technology. It will also become more intelligent and accurate, with a more adaptable personality. Italian academics noted that live streaming recently has not only offered a new marketing strategy for corporate brands but has also offered a new direct marketing channel for some small individual households. Live streaming has also improved consumer engagement by enhancing interactions between businesses and their patrons. Indian scholars examine the success factors, benefits, and drawbacks of live e-commerce based on the state of its development in China. They then project how live e-commerce will develop in the future, stating that it will eventually become the "standard configuration" of e-commerce, branding, and business. The research group at Lanzhou University emphasizes that the innovative development of marketing mode will be aided by the media's renewal. According to some academics, live broadcast is gradually incorporated into foreign trade activities under the umbrella of "Internet+," and foreign trade enterprises are starting to shrewdly use the live broadcast platform to support the growth of new digital foreign trade.

3.1.2. Data Collection and Analysis. This essay's research focus is on the big data media management model's impact on the network literacy education system for college students. Therefore, it is necessary to use the big data collection and management system. Today's big data management systems cannot only store a lot of data and create a network system that can hold a lot of data, but they can also analyze and process the data very quickly. A big data management system makes reasonable use of media like computers and networks to analyze and process a variety of data. It is becoming faster and more convenient to transmit and process digital information, and it is gradually being applied to more and more areas of life. This has a significant positive impact on people's ability to learn in the future, updates people's traditional views of data management, and significantly increases their ability to work efficiently. As shown in Figure 3, there are four main characteristics of big data management systems: a large storage volume, quick information processing, accurate and useful data results, and a wide range of data types.

3.2. Research Methods

3.2.1. New Hybrid Crow Search Algorithm

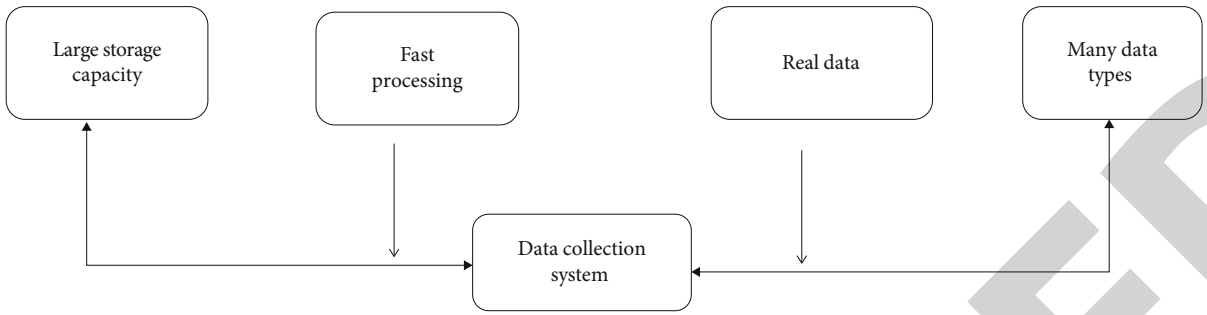

Figure 3: Characteristics of data collection system.

(1) Basic Crow Search Algorithm (CSA)

The crow search algorithm is a novel form of swarm intelligence that is based on the social behaviors of crows in nature, such as following one another to steal food and having good memory and communication skills. The algorithm is based on four basic rules: (1) crows live in groups; (2) crows can remember the location of food storage; (3) crows follow each other to steal food; and (4) crows can protect food from theft with a certain probability

Assume that the maximum number of algorithm iterations is G, the crow population is N, and the crows are active in D-dimensional space. The CSA algorithm works as follows: step 1: randomly sets up each crow's position; step 2: sets up the locations of each crow that is storing food; step 3: in order to determine the next object and update its location, each crow makes a random selection; step 4: determines each crow's fitness value; step 5: updates the locations of every crow that is feeding; step 6: if the algorithm's termination condition is met, the algorithm ends if ste6 produces the best solution to the problem (i.e., the location where all crows should store their food), failing which step 3 is invoked.

(2) New Hybrid Crow Search Algorithm (NHCSA) for solving PFSP

The encoding method is transformed with SPV. The iterative greedy algorithm deals with discrete artifact ordering directly, while the basic crow search algorithm is only suitable for optimizing continuous problems and cannot solve the PFSP directly. This paper converts between a set of continuous values representing the position and the artifact ordering based on SPV rules. The conversion of position to workpiece ordering is performed by selecting the dimension to which the smallest value belongs from a set of position values as the next workpiece to be processed each time, until all position values are traversed. The spatial dimension D takes the value of the number of artifacts n.

Initialization of the population, the effectiveness, and performance of the algorithm iterations are enhanced by a strong initial population. The NEH heuristic algorithm is the most popular approach because it can produce high-quality results quickly and when combined with population initialization, it can guarantee that the initial population contains individuals of high caliber.

In view of the simplicity and effectiveness of NEH, some scholars have conducted in-depth researches on it and proposed various NEH-based improvement algorithms, such as NEHD, NEHLJP1, NEHFF, NEHKK1, CLWTS, etc. Among them, NEHLJP1 is the one with the strongest merit-seeking ability. NEHLJP1 obtains the priority sequence of workpieces based on the mean, standard deviation, and skewness of the completion time of each workpiece on all machines; the TBLJP1 merit-seeking mechanism is proposed, which determines the final insertion position based on the sum of the weighted sum of the completion times of the workpieces to be inserted on different machines and the minimum amount of gap change generated during the insertion process. However, like other NEH-based heuristic algorithms, NEHLJP1 often generates multiple artifacts with minimum completion times and different sequences in the scheduling process of the last artifact, but only one of them can be selected as the result of the algorithm operation in the end, thus missing the information of high-quality solutions.

Based on iterative, greedy local search, the basic crow search algorithm shares the drawbacks of easily falling into local optimum and early convergence when tackling complex problems with other swarm intelligence optimization algorithms. The use of local search techniques can, to some extent, prevent the algorithm from entering a local optimum, enhancing the accuracy of the algorithm convergence. Using the iterated greedy (IG) algorithm for local searches is straightforward and efficient. Italian researchers and others used the iterated greedy algorithm to solve the PFSP problem first, then proposed the IG RSLS algorithm and confirmed its efficacy. The NHCSA algorithm flow is depicted in Figure 4.

NHCSA is based on the crow search algorithm, which explores the solution space based on the behavior of crows following each other, decides the concentration or dispersion of crows through the cognitive probability AP, and influences the range of crow search through the flight distance; transforms between crow location and artifact ranking based on the SPV rule; uses a new initialization method for population initialization to improve the quality and diversity of the initial population, and the introduction of the TBLJP1 mechanism enables the algorithm to further select the

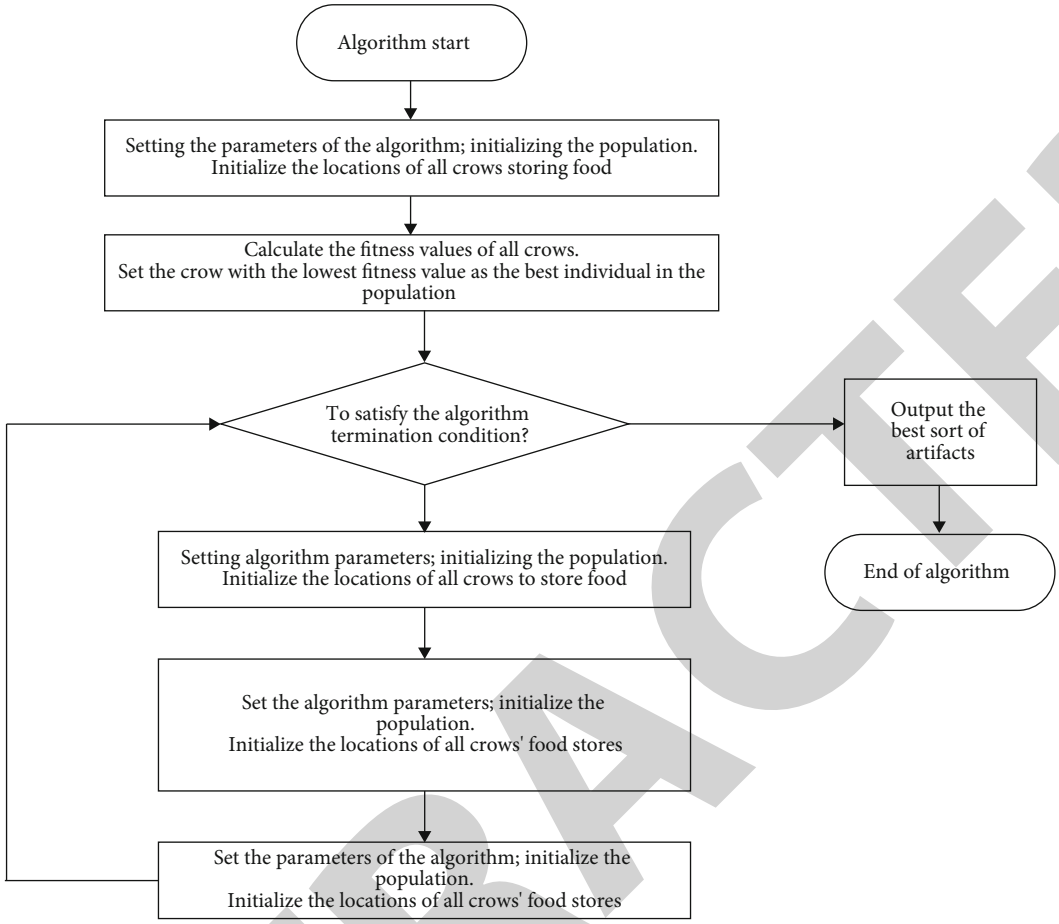

Figure 4: NHCSA algorithm flow chart.

potential optimal solution among multiple subsequences with the shortest completion time, which combines with the fast and efficient characteristics of the greedy iteration algorithm. This enhances the algorithm's ability to jump out of the local optimum, which can significantly speed up and improve the accuracy of the algorithm convergence. It also combines with the greedy iterative algorithm's fast and efficient characteristics.

The analysis of the computational complexity, since evaluating individual merit serves as a crucial foundation for the algorithm's operation, is necessary to continuously calculate each person's fitness value. A significant computational overhead is the time required to compute fitness values. The computation of fitness values is mainly concentrated in the iterative process of the algorithm, and the computation overhead of the population initialization phase is negligible.

Set (Ω, ζ, P) is a conceptual space, x the set of all wandering variables on the space involved. The risk metric ρ is a mapping x from a x_ρ subset of R to the real numbers, denoted as $\rho : X \in x_\rho \leftrightarrow \rho(X) \in R$.

First, define the g function called distortion function, if $g : [0, 1] \longrightarrow [0, 1]$, it is a monotone nondecreasing function and satisfies $g(0) = 0, g(1) = 1$.

Next, define the $\rho_g : x \longrightarrow R$ risk measure, often called distortion risk measure if $\rho_g(X)$ it satisfies:

$$\rho_g(X) \coloneqq \int_{-\infty}^{0} \lg\left(S_X(x)\right) - 1)dx + \int_0^{\infty} \mathrm{g}(S_X(x)))dx, X \in x. \tag{1}$$

Here is g the distortion function, which $S_X(x) = P(X \succ x)$ is X the tail distribution.

The X assumption is that the total risk faced $f : [0,\infty) \longrightarrow [0,\infty)$ by the insurer $f(X)$ is the partition function, representing the insurer transferring part of the risk faced by itself to the reinsurer. The reinsurer charges the insurer for the insurance premium to supplement the risk they bear because they assume a portion of the insurer's risk. In this paper, we assume that the reinsurance cost criterion has the following form.

$$\mu_r(f(X)) = \int_0^{\infty} r\left(S_{f(x)}(x)\right)dx, \tag{2}$$

where $S_{f(x)}$ is $f(X)$ the tail distribution $r : [0,\infty) \longrightarrow [0,\infty)$ about and is a monotonic nondecreasing $r(0) = 0$ function with. Without loss of generality, we assume that r it is not

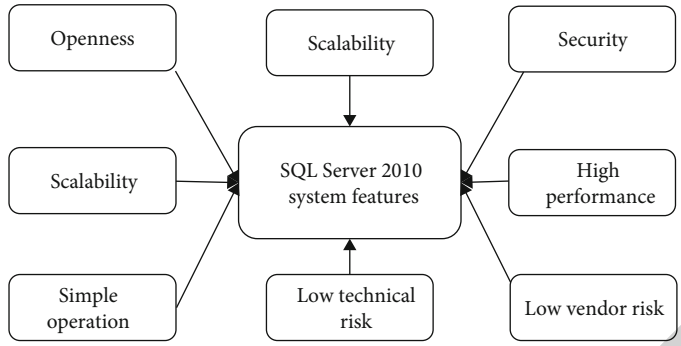

Figure 5: Main features of SQLServer2010 system.

a function that is zero almost everywhere, and that the total risk that an insurer has to face is the residual risk that it will face itself plus the cost required to transfer the risk. Expressed in the formula it can be expressed as

$$T_f(X) = X - f(X) + \mu_r(f(X)). \quad (3)$$

3.2.2. SQLServer Big Data Management System. As a new generation of database and analysis processing platform software, SQLServer database is quickly gaining popularity and acceptance from a wide range of enterprise customers. It is based on today's widely used Windows and other operating system platforms. In contrast to smaller databases like CCESS database and other popular database platforms like FoxPro, SQLServer offers a comprehensive set of robust and user-friendly database management and service processing features. There are engines that support extended feature functionality, standard SQL, and other database languages (such as replication, OLP, analysis, etc.). Additionally, it significantly outperforms the competition in terms of other crucial features, such as stored procedures and triggers, that can only be found in large database software.

Based on Microsoft SQLServer 7.0, Microsoft SQLServer2010 has been significantly expanded to improve database performance, reliability, quality management, and usability. A high-performance enterprise relational database management system with high reliability and usability is Microsoft SQLServer2010 database edition. Figure 5 illustrates the comprehensive and particular features of SQLServer2010.

Therefore, this paper selects SQLServer2010 for big data analysis; the first is SQLServer2010 version has been relatively mature; second, SQLServer is used to manage large databases, that is, analyze the use of big data; the use of this software is more appropriate; finally, SQLServer is a more commonly used software for analyzing big data, which makes it easier for other researchers to understand this paper.

3.2.3. Orcle Big Data Analysis and Research. Orcle database management system is a relational database management system from Germany Orcle software company (Chinese name Orcle) developed by the company. It is probably another database product that Microsoft will design with distributed database as its core feature. It will also be one of Microsoft's most popular distributed C/S server architecture or distributed B/S database architecture in the world. State "questioning" is one of the most attractive performance advantages of the Orcle database parallel server model compared to SQLServer. It allows you to split any subquery into any number of subqueries and then execute the subroutines on two different server CPUs. It greatly improves the performance of multiprocessing systems, which should be a potential competitive advantage in the next few years of rapid growth of the data trend. The Orcle database has a number of other significant advantages over the Orcle database and completes data storage management storage capability. The data storage capacity is large; the persistence time is long, and the data can be shared, ensuring reliability, complete related products, perfect distributed management function, simple operation, and so on. This is shown in Figure 6.

4. Results and Discussion

4.1. Economic Status Quo of E-Commerce Live Broadcast. Live streaming economy is a brand-new economic form created by the extensive use of live streaming by e-commerce platforms. It is supported by mobile communication technology and Internet application. According to some academics, the use of e-commerce platforms for live streaming has generated enormous profits for merchants and platforms, and the volume of platform transactions has been steadily increasing, making live streaming economy a common sales model at the moment. According to some academics, webcast is a new business model that employs live broadcast technology to show products online in real time, direct customers to make purchases, and respond to customer questions locally. The explosive growth of live streaming, which has been fueled by the rapid uptake of mobile Internet, has given economic growth a new lease on life and continues to do so by leveraging its advantages of high-quality, low cost, and robust interaction. According to some studies, e-commerce live marketing will become more professional, standardized, intelligent, accurate, and flexible in the future with the innovative development of AR and VR technology and the further popularization of 5G technology. Italian scholars mentioned that recently, live streaming not only provides a new marketing method for corporate brands but also provides a new direct marketing channel for some small self-employed. Live streaming enhances the interaction between merchants and consumers and greatly increases the participation of consumers. Based on the

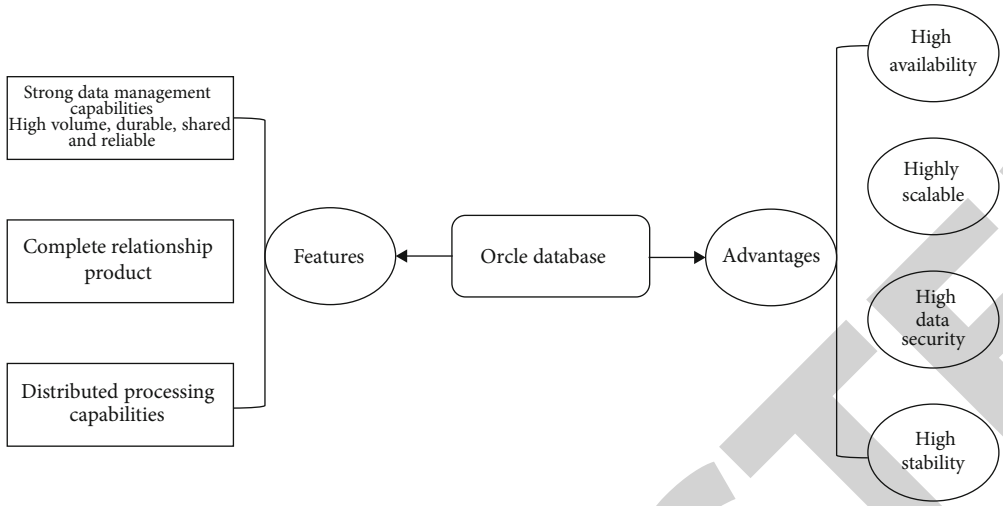

Figure 6: Features and advantages of Orcle database.

current state of Chinese e-commerce development, an analysis of its success factors and consideration of its benefits and drawbacks, an Indian scholar's paper projects future directions for e-commerce. This paper emphasizes that as e-commerce advances, it will eventually become the "standard" of business and will experience continuous growth. Lanzhou University research team stressed that the renewal of media will help the innovative development of marketing model. Some scholars point out that under the role of "Internet+", live streaming has gradually integrated into foreign trade activities, and foreign trade enterprises have begun to skillfully use live streaming platforms to help the development of digital new foreign trade. China's mobile Internet users and their proportion from 2012 to 2020 are shown in Figure 7.

Internet celebrity economy is a hot industrial form in recent years. Some scholars believe that Internet celebrities are people who become famous on the Internet because of a certain behavior or event that people pay attention to, also known as Internet celebrities. Net red uses the Internet spread fast, and far-reaching characteristics continue to develop and operate their own fan circle, with the help of a huge fan group to create traffic, in order to obtain huge business opportunities. "Internet celebrities" from a simple social behavior to a complex economic behavior, driving the emergence of a new economic model, based on technology, Internet celebrities economy can continue to progress with the innovation of Internet technology, create higher economic benefits, and add strength to the real economy. A foreign scholar believes that social media provides a new way to obtain news content, and the suggestions of social media improve the trust of media and make people expect to get more news from specific media channels. When friends who share stories on social media are perceived as opinion leaders, the influence brought by these social media will be amplified. Huang argues that the Netflix economic model is a hot new marketing model that leverages the business opportunities brought by the precise targeting and traffic of big data, while using the influence of traffic and the popularity of Netflix, and using self-media as a medium to closely connect merchants and consumers as a way to carry out marketing activities. According to the foreign research team, Netflix endorsement has become a well-liked form of content marketing for e-commerce sellers due to the widespread popularity of social media and live streaming. The article offers fresh perspectives for online merchants to assess the financial worth of a Netflix endorsement, highlighting the fact that this is a brand-new method of content marketing for e-commerce sites. Value and forecast for online retail transactions from 2016 to 2021. As shown in Figure 8.

4.2. E-Commerce and Related Live Streaming Concepts and Characteristics

4.2.1. Basic Concept of Live e-Commerce Infrastructure. Every industrial (technology) revolution will give birth to a new generation of infrastructure, and currently we are entering the era of intelligence based on 5G, big data, cloud computing, Internet of Things, etc., which requires the concept and scope of infrastructure to be redefined with the support of intelligent technology. At present, the concept of business infrastructure is rarely mentioned, but business as an important support for service production and life, especially in the era of digital economy shows the operational thinking and important functions of infrastructure, so the understanding of business infrastructure should be different from general infrastructure. Business as an important grip of general infrastructure to enable social change, there are differences in the way it performs and the role it plays at different stages. In the Internet era, especially in the mobile Internet scenario, the digital economy features prominently, and the single physical infrastructure leaps to the combination of reality and reality, leading to disruptive changes in the social economy and ecological system.

Alibaba, as the leading e-commerce company and the earliest company to test the new retail, its executives often mention the concept of business infrastructure on different occasions. For example, Jack Ma believes that business infrastructure is the core indicator of Ali, including transaction market, payment, logistics, cloud computing, and big data.

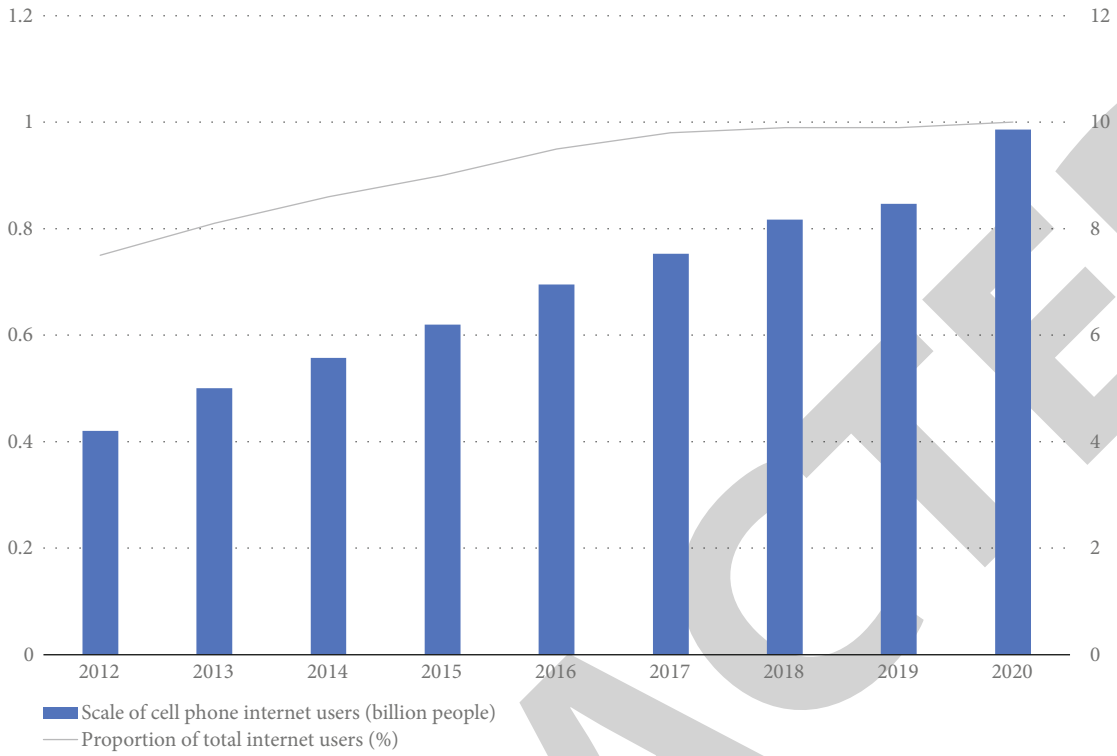

Figure 7: Mobile Internet users and their proportion in China from 2012 to 2020.

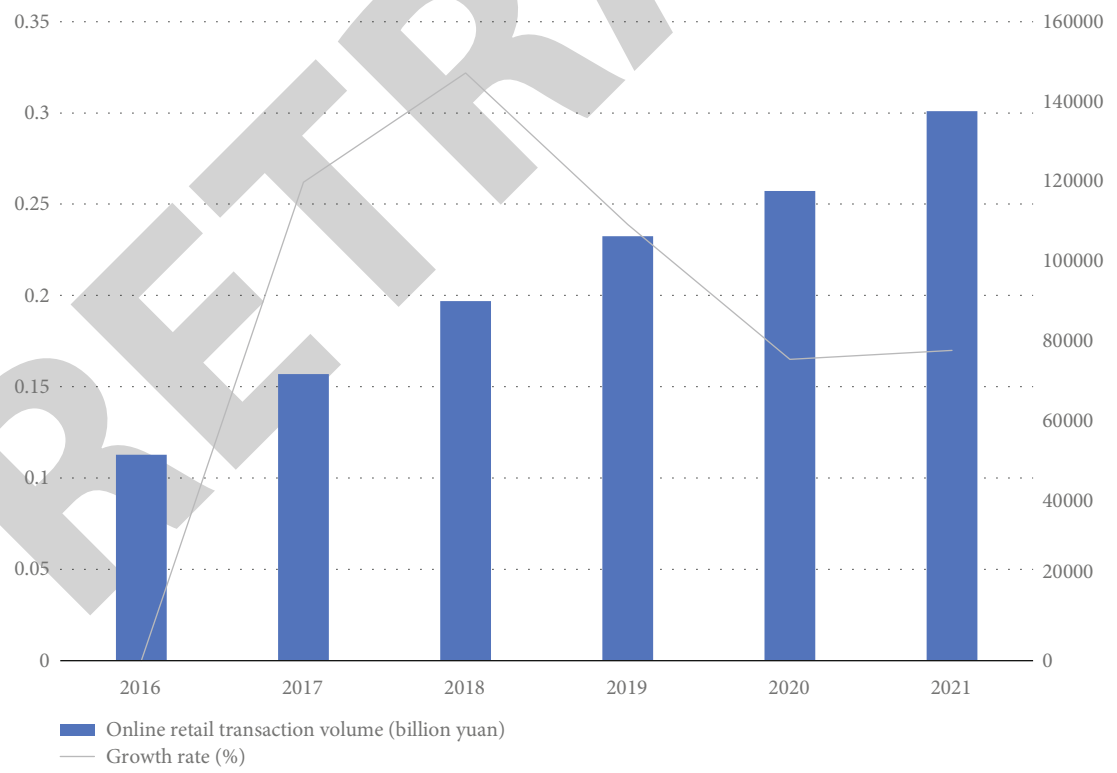

Figure 8: Online retail transaction value and forecast from 2016 to 2021.

There are also scholars, industry experts, and research institutions, among others, who have noted the issue of new business infrastructure. For example, Zhang proposed that the new business era needs new business infrastructure, mainly including three aspects of new payment, new logistics, and new information channels; Wang believes that the

Internet and logistics have become new infrastructure that can promote the integration of product flow and information flow, such as Alibaba through the e-commerce platform in accordance with the positioning of business infrastructure operators continue to cross borders, and Jindo through social links to consumers highlight the social traffic infrastructure concept. Overall, the industry's definition of the concept of new business infrastructure is fragmented, reflecting different perspectives on economic dynamics, industry development, and business nature. Alibaba, as a leading business innovation company, has been building a new business infrastructure system based on its platform, technology and resources, and executives such as Jack Ma, Zhang Yong, Liang Chunxiao, and Gao Hongbing have expressed their views on Alibaba's business infrastructure empowerment in public. The concept is expressed in a generalized manner. Some scholars and institutions also emphasize the role of new business infrastructure in empowering consumption and its basic components, such as Liuhe Consulting, which emphasizes the role of new business infrastructure in transforming both merchants and consumers' lifestyles, and Zhang Wenkui and Liuhe Consulting, which both consider e-commerce channels, mobile payment, logistics, and distribution as the main components of new business infrastructure. In addition, based on different levels of development policies and development realities, scholars have developed a multiperspective reality note on this concept.

Business is an economic activity that promotes the circulation of goods by buying and selling, and commercial infrastructure should be an infrastructure related to the circulation of goods, which serves both production and life. Overall, it seems that commercial infrastructure is a broad concept, and in a general sense, based on economic kinetic energy, commercial infrastructure can be understood as the economic form that plays the kinetic role of commercial-driven economic development, such as e-commerce showing the basic function of driving economic development; based on the industry itself, commercial infrastructure can be understood as the underlying technology and hardware facilities that support commercial development, such as electronic payment technology. Based on the nature of business, business infrastructure should be understood as an integrated business model that supports production and life services and reflects the function of infrastructure. The new business infrastructure is different from the traditional business infrastructure, and its "new" does not mean old or new but reflects the disruptive change, dynamic development, and all-round empowerment trend of business infrastructure in the digital economy. It should be noted that commercial infrastructure in the digital economy follows the logic of consumer-centric services based on retail transformation, so the understanding of the new commercial infrastructure should also tend to be from the perspective of terminal commerce. Based on the perspective of terminal business and business essence, the new business infrastructure can be understood as the underlying business system that integrates intangible and tangible facilities in the digital economy era, with digital business innovation model as the core, and efficiently supports production and life services. Compared with the traditional concept, its differences are mainly reflected in four aspects: first, breaking through the traditional commercial infrastructure mainly focuses on the underlying logic of empowering businesses, shifting to the basic logic of empowering production and life, especially life services as the core, and expanding the boundary and depth of commercial infrastructure empowerment; second, highly emphasizing the empowering effect of digital technology, embodied in a series of information technology support and application of efficient business. Third, break through the boundary of traditional commercial infrastructure mainly defined as tangible facilities, emphasize the integration of tangible and intangible facilities, and show the integrated service functions of facilities through business model innovation; fourth, break through the concept of separation of commerce and logistics and emphasize the integration of logistics into commerce to realize integrated support for production and life services.

4.2.2. Main Features of e-Commerce Infrastructure. Unlike general infrastructure, business infrastructure is closely integrated with business model. Business is a continuous evolutionary process, which relies on technology support and combines with consumer demands to continuously promote the reconfiguration of elements. The new business infrastructure is an infrastructure highly dependent on the Internet, and in general, the evolution of the business ecosystem with e-commerce as its core reflects the macrohistory of its development. Looking at the development reality in China, e-commerce as the core business has generally undergone several iterations since the end of the 20th century, and each stage demonstrates a different logic of infrastructure operation, which can be regarded as different stages of the construction of new business infrastructure.

The traditional business infrastructure is a business infrastructure with physical space as the core, and this concept also corresponds to the tangible characteristics of traditional infrastructure, while the new business infrastructure with e-commerce as the core continuously promotes the integration of functional elements. From the perspective of core elements, supported by the (mobile) Internet, the new commercial infrastructure has undergone reconstructive changes in traffic, property, logistics, payment and technology, with wide area linkage, virtual-real combination, and strong technical empowerment highlighted, showing a more powerful enabling role; from the perspective of organizational logic, the new commercial infrastructure highlights the human-centered service logic, realizing efficient, and accurate matching of supply and demand. From the perspective of organizational logic, the new commercial infrastructure highlights the human-centered service logic and achieves efficient and accurate matching of supply and demand; from the perspective of intrinsic characteristics, the new commercial infrastructure drives cost and efficiency optimization while highly reflecting the role of consumer sovereignty and satisfying consumer demands in all aspects; from the perspective of industry display, the new commercial infrastructure shows pan-innovation characteristics

and effective integration of commercial elements. Overall, the new business infrastructure, through the coupling of tangible and intangible facilities and the extensive and deep application of new generation information technology, effectively empowers economic and industrial development, production and circulation optimization, and demand for a better life, and generally demonstrates the operational thinking and capability of digital infrastructure.

5. Conclusion

In the reality of the increasingly strong development of e-commerce and live broadcast, this paper combines the concept of digital economy focusing on the nature of new business infrastructure for efficient production and life services to try to depict the overall picture and construction logic of e-commerce live broadcast; however, from the systemic, dynamic, and complex characteristics of e-commerce live broadcast, there are many issues that need to be studied in-depth in the future, including: further defining e-commerce live broadcast from multiple perspectives, clarify the boundaries of government and enterprises in the new e-commerce live, etc. In China, it is important to promote the theoretical research of new business infrastructure to help the development of practice in many aspects, and we hope that this paper can bring the effect of "throwing bricks to draw jade" to the research of new business infrastructure.

Data Availability

The dataset can be accessed upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

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