

# Research on the Dilemma and Path of Rural Industry Integration and Internet Revitalization Driven by E-commerce

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The emergence of Internet technology provides a new development mode for the development of rural industry. In view of the fact that the rural integrated Internet is in its infancy, and the unpredictability and uncertainty of "Internet +" innovation in the era of "digital economy", the development of rural integrated Internet is facing many challenges, and there are development misunderstandings and dilemmas. This paper studies the dilemma and path of rural industry integration and Internet revitalization driven by e-commerce. Driven by e-commerce, this paper analyzes the current situation of the Internet revitalization of rural industry integration, summarizes the problems existing in the Internet revitalization of rural industry integration, constructs a grey correlation model to analyze the correlation degree of the influencing factors in the rural industry and Internet integration, and takes a certain rural industry as an example to prove that the model can be used to analyze the relationship between the two factors. On this basis, the paper puts forward the effective strategies of rural industry integration and Internet revitalization driven by e-commerce.

**Keywords:** E-commerce, rural industry, Internet, Grey relational model, Correlation degree

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## INTRODUCTION

In recent years, the importance of Internet technology has been ignored in the production and management of rural industries in China. In the era of continuous iterative updating of Internet technology, all walks of life in society have, to varying degrees, built online virtual stores and virtual companies with the help of Internet technology, reducing the sales pressure of physical stores<sup>1</sup>. In all aspects of the rural industry, the Internet technology can make the whole process from the production to the sales of relevant agricultural products become Internet, form the rural e-commerce industrial chain, and subvert the current traditional agricultural product management mode. In the report of the 19th National Congress of the Communist Party of China: "to implement the strategy of Rural Revitalization", in the process of national modernization in the future, it is necessary to

remove the institutional and institutional barriers that hinder the implementation of rural and rural industrial development, continuously inject new development momentum, and stimulate the potential and vitality of agricultural and rural development"<sup>2</sup>. However, due to the inherent characteristics of rural industry, the production environment and the application of Internet technology, there are certain limitations, so there are some disadvantages in the process of e-commerce of rural industry in China. How to improve the e-commerce of agricultural industry and improve the level of Internet application has become a hot issue in this field.

Document<sup>3</sup> proposes a strategy of information sharing for agricultural electric business based on "Internet plus". This paper analyzes the late development trend of Internet and agricultural integration, and constructs the production information sharing model of Internet and

agricultural e-commerce supply chain according to the trend. The model requires agricultural e-commerce operators to share agricultural information, and constantly improve the integration degree between Internet and agricultural e-commerce according to the comprehensive shared information. This question mainly focuses on agricultural e-commerce information sharing, which has certain reference value, but it still needs to provide specific integration measures. Document <sup>4</sup> proposed to build a platform for the Internet plus agriculture industry chain. This paper analyzes the important role of Internet technology in the development of rural industry, and proposes to build a platform. In this paper, the rigid requirements of the platform are analyzed in detail, and the platform functions are set up on this basis. Finally, the operation principle of the platform is explained, and the relevant strategies of integrating agriculture and Internet are proposed. The construction of the platform is conducive to the development of rural industrial economy, but the functions considered in the operation process are too complex to operate. Literature <sup>5</sup> proposed to use Internet technology to create agricultural brands. Under the background of the Internet, this paper designs the brand of agricultural products according to its real and social significance, constantly integrates Internet thinking into the rural industrial economy, excavates the concept and characteristics of the agricultural product brands studied, and classifies them in detail, and finally completes the brand building of agricultural products. In this paper, the brand building of agricultural products and the spread of agricultural products concept through the Internet effectively promoted the development of e-commerce in rural industries. However, the analysis of this paper is relatively simple, and the types of agricultural products are complex, so it is difficult to achieve all of them.

In view of the shortcomings of the above methods, in view of the problems existing in the integration of rural industry and Internet, this paper constructs the grey correlation model to realize the rapid integration of rural industry and Internet driven by e-commerce.

## ANALYSIS ON THE CURRENT SITUATION OF RURAL INDUSTRY INTEGRATION AND INTERNET REVITALIZATION

### Vague Understanding and Unclear Positioning

The development of e-commerce has become a powerful driving force to promote the development of rural industry, the change of villages and the increase of farmers' income. However, in many places, the reform is still in its infancy, and the root of e-commerce is not fixed. Under the impact of e-commerce, it brings challenges and opportunities to rural e-commerce <sup>6</sup>. However, the subjective thinking and thinking mode of township cadres and villagers have not changed with the advent of the "digital economy" and the Internet. They cannot understand the "Internet plus" and "digital economy", and cannot take the lead in practicing them. Most of them think that e-commerce is a way of "selling goods on the Internet", relying on low prices and volume, and lack of understanding of the advantages of the Internet and other new agricultural formats.

### Lack of Talent, Poor Help

The biggest obstacle to the development of rural e-commerce is the lack of talents. With the return of "new farmers", a large number of villagers who have never been involved in e-commerce have been driven to invest in the field of e-commerce, but many villagers have poor cognitive ability of e-commerce <sup>7</sup>. The ability to create selling points by refining the characteristics and advantages of products is far from enough, and there is a serious lack of skills in product informatization, visual design, network brand building, network marketing, data analysis, online store operation and new media promotion. Although all parts of the country have invested a lot of money to carry out e-commerce skills training, the form of training is to spread the network, only quantity, not quality. The content of training is superficial knowledge popularization. For the real emerging farmers engaged in e-commerce, the required professional knowledge is far from enough. At the same time, the lack of professional organizations and institutions can provide follow-up tracking and assistance for e-commerce practitioners. In the

process of e-commerce operation, professional problems cannot be effectively solved, which greatly reduces the enthusiasm and sustainability of farmers to embrace the "Internet".

### **Incomplete Service, High Cost**

Rural e-commerce western medicine relies on network and logistics infrastructure. Among them, the installation of infrastructure network facilities is the cornerstone of e-commerce of rural industry, but at present, the communication equipment and signal coverage in remote mountainous areas are not good; the logistics and distribution infrastructure construction in rural areas, especially in remote areas, is weak <sup>8</sup>, the government and enterprise level investment is insufficient, the rural express logistics construction lacks top-level design and unified planning, and many of them are third.

## **THE NECESSITY OF RURAL INDUSTRY INTEGRATION AND INTERNET REVITALIZATION**

### **Online and Offline Integration, the Internet Has Brought New Potential to Rural Industry Revitalization**

Rural e-commerce is an important part of digital economy and a new engine for the development of agriculture, rural areas and farmers. From the city to the countryside, relying on the Internet, initially promote the rural industry to diversify development. The emergence of electronic information technology has not only changed the overall environment of the countryside, but also spread the thought of "Internet plus", and has brought in a wealth of wealth for the rural industry. E-commerce has completely changed the traditional way of life and production of farmers in China's rural areas for thousands of years. E-commerce is becoming the booster of rural industry revitalization and effectively promoting the development mode of urban and rural integration. Since 2014, e-commerce has been promoted in rural demonstration counties, and the development of rural online industry has provided impetus for it.

### **Up and Down Synchronization, E-commerce in Rural Revitalization Show Their Magic Power**

E-commerce is sinking in rural areas, which is developing rapidly, continuously and deeply in practice. The change of connotation and extension of rural e-commerce has changed and continues to change the future development. The rural areas of Zhejiang, Anhui and Gansu provinces have integrated the Internet to develop rural industries, and accelerated the reform and development of local villages. In recent years, Zhejiang has always been ranked first in the country and far ahead in the number of Taobao towns or Taobao villages. Since the eighteen Party's Congress, Anhui has seized the opportunity of "upgrading consumption, upgrading tourism and experiencing leisure economy", and has made deep explorations in the field of rural revitalization, especially in the field of e-commerce, Internet plus agriculture, rural areas and farmers <sup>9</sup>.

### **Internet Technology Promotes Entrepreneurship and Innovation of Rural Industry**

Under the promotion of Internet technology, many young people in big cities are willing to go back to their villages to start their own businesses, making the countryside a new fertile land for them to display their talents. Internet technology makes the world common, and the speed of understanding information is faster. The rural areas with cash attract a large number of "new farmers" to return to their hometown to join in the vigorous Rural Revitalization. Their return improves farmers' understanding of the Internet and promotes the continuous upgrading of new rural industries.

## **COORDINATED GREY RELATIONAL MODEL OF RURAL INDUSTRY INTEGRATION AND INTERNET DEVELOPMENT**

Based on the analysis of the current situation and dilemma of the integration of rural industry and Internet, this paper proposes to build a coordinated grey correlation model of rural industry integration Internet development, analyzes the correlation degree between agricultural

industry and Internet, and measures the main factors hindering the integration of rural industry and Internet, so as to provide targeted strategies for the integration of the two. In the process of rural industrial e-commerce trend development, the factors such as packaging, brand intention, message delivery rate and logistics are important factors affecting the development of rural industry

e-commerce. The factors that affect the integration of Internet and rural industries are regarded as a whole system, in which each single factor is a subsystem. The steady-state analysis of the harmonious coexistence between each subsystem and its parameters is carried out <sup>10</sup>. Firstly, it summarizes the relevant factors in its integration development, as shown in Table 1:

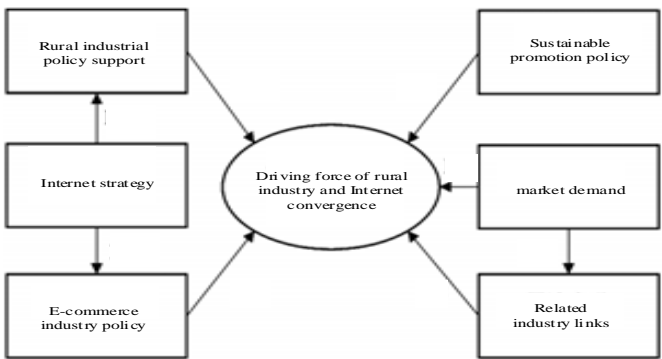
Table 1.  
Influencing factors in the integration of rural industry and Internet

Measuring indicators	Main factors	Association assignment
Driving force of e-commerce in rural industries	Rural industrial operators have low Internet concept and poor use of Internet technology	Proportion and local GDP of output value of rural industry in e-commerce
	Limited communication barriers, policy implications and investment promotion	The profit growth rate Logistics Development Degree of Internet in Rural Industry
Indicators	Rural industrial policy	Rural industrial policy
	Sustainable policies	Financial input on related Internet technologies
	Market demand	Total rural industrial production

In Table 1, the specific factors affecting the effective integration and development of the two are analyzed. According to the analysis in Table 1, the

framework of influencing factors is constructed, as shown in Figure 1:

Figure 1.  
Research framework of driving force of rural industry and Internet integration development



After the above analysis of the influencing factors between the Internet and rural industry, this paper selects the grey correlation model <sup>11</sup> to predict the correlation degree between the rural industry and the Internet integration: Firstly, the correlation parameters and comparison sequence between the two fusion methods are

obtained. Set the rural industry as the dependent variable in the model, that is  $X$ , and set the Internet as the parent sequence, that is  $Y$ . In order to accurately analyze the development status of the integration of rural industry and Internet in a period of time, and ensure that the two factors influencing the integration of the two are unified, the initial processing is carried out, i.e.

Research on the Dilemma and Path of Rural Industry Integration and Internet Revitalization Driven by E-commerce dimensionless processing<sup>12,13</sup>. After processing, the following results are obtained:

$$C_i = \frac{X_i(\varphi)}{Y_i(\varphi)}, i=1,2,\dots,n \quad (1)$$

After preprocessing the original factors affecting the integration of rural industry and Internet, the maximum error value is obtained by comparing the obtained results with the standard data :

$$\Delta MAX = |a_i^X(\varphi) - a_i^Y(\varphi)| \quad (2)$$

In the formula,  $a_i$  represents standard data .

The minimum error value is obtained :

$$\Delta Min = \min_i \min_{\varphi} |a_i^X(\varphi) - a_i^Y(\varphi)| \quad (3)$$

At this time, the gray correlation coefficient matrix is constructed to determine the correlation coefficient in the integration of rural industry and Internet, so as to realize the calculation of the correlation degree between them .

If the correlation coefficient of  $X_i$  is  $X_i(k)$  and the correlation coefficient of  $Y_i$  is  $Y_i(k)$ , then the incidence matrix<sup>14</sup> between the two can be expressed as follows:

$$\xi_i = \frac{\Delta Min + X_i(k)\Delta max}{\Delta max + Y_i\Delta Min} \quad (4)$$

At this time, the final correlation degree in the process of rural industry and Internet integration is

calculated, that is:

$$G = \frac{1}{n} \sum_{k=1}^n \xi_i \quad (5)$$

According to formula (5), the greater the value, the greater the degree of correlation, which indicates that this influence factor is an important factor affecting the integration of rural industry and Internet<sup>15</sup>, and the key treatment is carried out.

## EXPERIMENTAL ANALYSIS

### Basic Information of The Experiment

In the integration of rural industry and Internet development, in order to verify that the method proposed in this paper can effectively analyze the correlation degree of its related influencing factors, this paper makes a simple experimental analysis on the representative vegetable industry in rural industry. The agricultural products in this area are mainly carrots, kidney beans, cucumbers and so on. There are 200 operators. The basic situation of these 200 people is investigated. Among them, 120 people have junior high school education level, and 80 think that they have college level or above. The sales situation of agricultural products in recent three years has been investigated, as shown in Table 2:

Table 2.  
Sales of agricultural products in the experimental area from 2016 to 2018 / (yuan)

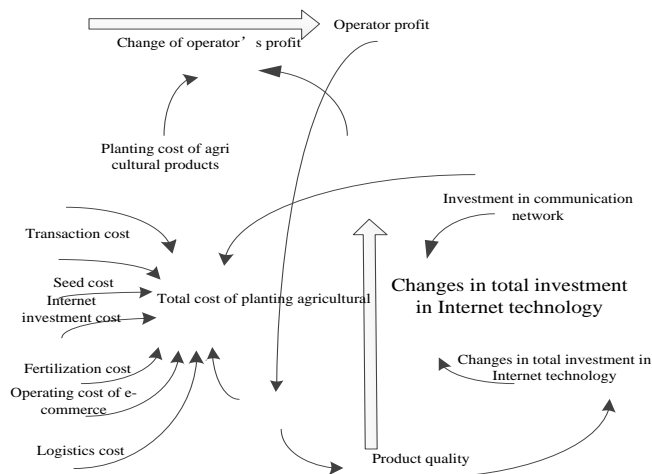
particular year	Seed cost	Fertilization cost	Equipment investment	Internet operating costs	Logistics cost	transaction cost	transaction cost
2016	150	500	200	150	100	20	1120
2017	140	520	200	140	110	20	1130
2018	152	540	200	151	100	21	1164

### Structural Design of Influencing Factors of Experimental Samples

The correlation degree of influencing factors between agricultural products and Internet

convergence in the experimental area was analyzed. According to the experimental objects, the structure of relevant influencing factors in the experimental sample was constructed, as shown in Figure 2:

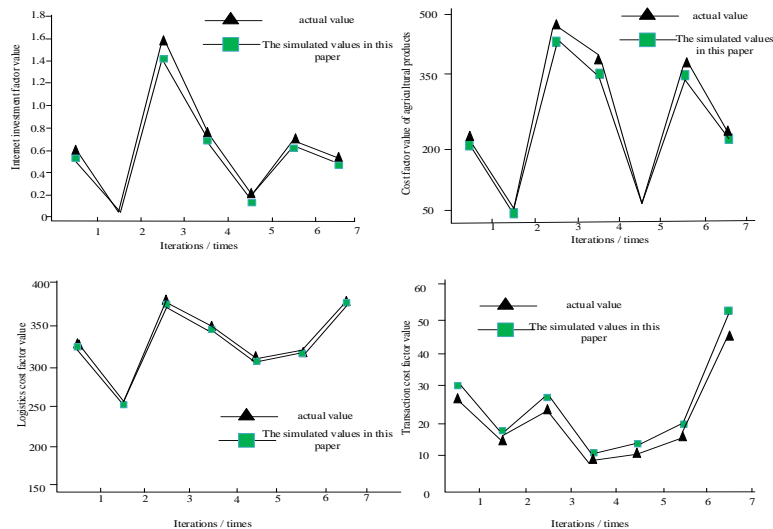
Figure 2.  
Structure of influencing factors in the integration of agricultural products and Internet



**Analysis of Experimental Results**  
In the above experimental environment, the similarity degree of influencing factors in the integration of agricultural products and Internet in the experimental area was analyzed, and compared with the experimental standard value. Four factors

including Internet input, agricultural product cost, logistics cost and transaction cost were analyzed. The accuracy of correlation degree was evaluated by the model constructed in this paper. The experimental results are shown in Figure 3:

Figure 3.  
Accuracy Analysis of similarity evaluation of influencing factors in the integration of agricultural products and Internet



As can be seen from Figure 3, with the help of the grey correlation model constructed in this paper, the correlation degree of the four factors, namely, Internet investment, agricultural product cost, logistics cost and transaction cost, is evaluated. The actual value is in good agreement with the estimated value, which proves that the model constructed in this paper can provide some help for

the integration of agricultural industry and Internet.

E-COMMERCE DRIVEN RURAL  
INDUSTRY INTEGRATION AND  
INTERNET REVITALIZATION STRATEGY

Driven by e-commerce, rural areas integrate Internet to achieve innovation, and change rural

industries with Internet technology. In the integration of the two, the following points should be achieved:

### **Use Platform, Close to Platform, Adapt to Platform**

Under the promotion of network technology, rural industry should rely on e-commerce related platforms to adapt to the new Internet environment. Internet technology greatly shortens the distance between suppliers and consumers, directly supports the formation of large-scale cooperation, and provides the possibility for creating greater value. The platform can provide strong capabilities to rural development and lead the development and prosperity of the countryside. It will make use of platforms, platforms and platforms to achieve breakthroughs in the building of agricultural products, the upturn of products, the supply side of agriculture, the integration of 123 industries, the extension of the rural industrial chain and the "Internet plus poverty alleviation".

### **Participate in Sharing, Embracing Customers, Precision Camp**

Through the Internet, we can link the national and even global markets, and break through the external circulation of rural economy. With the rapid development of the Internet, growers can directly share information with consumers to meet the needs of customers at the fastest speed. The transformation of consumers forces enterprises and business households to change in the direction of "platform + enterprise + individual". Enterprises and growers can change from focusing on production and planting agricultural products to embracing customers. Only in this way can they "meet" a large number of "small but fast" products.

### **Mining Data, Insight into Data, Embracing New Retail**

Use Internet platform big data insight to reverse promote the production of agricultural products, explore green and ecological agricultural products, promote the standardization and branding of good agricultural products in scale, and take the new characteristics, new requirements and new resources

of e-commerce as the "catalyst" to promote the integration of production, processing and marketing of agricultural industry chain and the integration of agricultural tourism. By mining platform data and forcing planting personalization, it will promote the development of rural industry and comprehensively improve the total factor productivity. Give full play to the role of the Internet in connecting people, commerce and industry.

### **Strengthen Internet Technology Training and Increase Infrastructure Investment**

In the integration of rural industry and Internet, we should strengthen the training of Internet technology for local villagers to improve their mastery of network technology.

1. Implement e-commerce popularization project. Integrating the resources of local universities and vocational schools, promoting the e-commerce professionals of colleges and universities to go to the countryside to carry out "e-commerce poverty alleviation", improve the coverage of e-commerce popularization, and continuously improve the practicability and pertinence of skill training; rural e-commerce is developing and changing rapidly in the direction of mobile terminal, socialization, localization, service, scale, systematization and supply chain, which urgently needs government system. Formulate relevant supporting policies to attract more e-commerce service teams and highly skilled talents from all ends of the e-commerce industry chain to work in rural e-commerce enterprises.

2. Strengthen the construction of industry organization. We will promote rural e-commerce associations and other organizations at the county, town and village levels to build a relatively complete rural industry and Internet system. Integrating the central e-commerce and social e-commerce, integrating wholesale supply and direct retail and other e-commerce forms, we can carry out the online marketing brand construction of selling local characteristic products in multiple ways and forms.

3. In general, the rural e-commerce investment is small and the effect is fast, and the limited funds can leverage the large market. At present, there are

corresponding special funds for e-commerce in human resources, social security, commerce and other departments. However, in the use of funds for rural e-commerce, more investment is put into the training of rural e-commerce entrepreneurial talents, and the funds and energy invested in supporting the main body of agricultural products e-commerce service enterprises and creating a good development environment are far from enough. The effect of net spreading investment is not obvious, and more needs follow-up assistance and precise investment for rural electricity merchants.

### Set up Service Carrier and Coordinate Industrial Resources

1. E-commerce park is an important carrier for the development of Internet economy. It provides personnel training, operation promotion, procurement contact, industrial advantage mining, network brand construction, etc. for agricultural enterprises, individual growers and cooperatives, and establishes the rural industrial ecological cooperation chain integrating three industries to achieve a win-win situation for the transformation and development of the Internet between individual growers, cooperatives and agricultural enterprises.

2. Through the county level e-commerce public service center and the village level e-commerce service station, we can break through the bottleneck, reasonably arrange the rural e-commerce service and Internet access technology resources, and expand the benefit scope. Docking with professional teams, we should deeply explore local characteristic agriculture, make primary agricultural products have standards, brands and images, and transform them into agricultural commodities and online goods, expand market space, and drive the development of secondary and primary industries. With the advantages of market, data, technology and capital, we will participate in market docking, production and marketing docking.

3. According to the needs and reality of local rural development, relevant departments organize and establish professional organizations such as Internet Technology Training Association and

Logistics Association. The industry association will lead and coordinate agricultural enterprises, individual growers and cooperatives, build a platform, do a good job in rural e-commerce practitioners, promoters and advisers, jointly promote rural industrial innovation, integrate resources, and expand the path of capital sources. Establish an Internet Ecosystem covering urban and rural areas, share resources and information, and transform the Internet together.

### Supporting and Highlighting the Role of Rural Supply and Marketing Cooperatives

In the large-scale development of rural industry, rural supply and marketing cooperatives have a complete organizational system, close to the countryside and farmers, familiar with local characteristics of agricultural products, whether it is supply and marketing companies to start their own businesses or help new farmers to start their own businesses.

## CONCLUSION

By analyzing the current situation and necessity of rural e-commerce and Internet revitalization, this paper constructs a grey correlation model to analyze the correlation degree of influencing factors in the integration of rural industry and Internet, and takes an industry in a rural area as an example to prove that the model can effectively evaluate the correlation between the two influencing factors. On this basis, the paper puts forward the concept of "electricity" The effective strategy of rural industry integration and Internet revitalization driven by sub commerce.

Although this paper is feasible to a certain extent, there are still many deficiencies in the analysis. In the future, we will analyze the reasons for the current development of rural industry, and make further improvement to improve the development of rural economy.

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## REFERENCE

1. GUO H Y , FAN C J , LI J C , WANG L , WU H C , YANG Y P . Research on Synergetic Evolvement of E-commerce Industry and Big Data Industry Considering Internal and External Factors[J]. Operations Research and Management Science , 2019,28(3):191-199.
2. ZENG S H , YANG P , XU Y C . Internet Popularization and the Servitization of Industrial Structure—On the Development Strategy of Rural Service Industry Under the Background of Rural Revitalization[J]. Industrial Economic Review, 2019,10(1):36-55.
3. Zhao L L . Research on information sharing strategy of agricultural electric business based on Internet plus[J]. Journal of Commercial Economics , 2019,13(13):111-114
4. Tang R , Guan X Y , Yu R. Construction of Collaboration Platform for "Internet Plus Agriculture" Industry Chain[J] . Forum on Science and Technology in China , 2018,14(09): 121-127.
5. Zang H , Ling N . Ecological System Design for Branding Service of Creative Agriculture in Internet + Era[J]. Packaging Engineering , 2018,39(12):165-168.
6. Xu W L . CONSTRUCTION AND VERIFICATION OF EVALUATION INDEX SYSTEM FOR THE INTEGRATION DEVELOPMENT OF AGRICULTURE AND SECONDARY AND TERTIARY INDUSTRIES—A CASE STUDY OF SUZHOU[J]. Chinese Journal of Agricultural Resources and Regional Planning , 2019,40(4): 226-232.
7. XIA D J , WANG Y . Research on the Evolutionary Path of the Vertical Structure of the E-commerce Industry Chain[J]. Statistics & Information Forum, 2018,33(6) : 87-93.
8. ZHANG W . The Development Trend of China's Logistics Industry in the Era of "Internet Plus"[J]. Technoeconomics & Management Research , 2018,14(4) : 104-108.
9. WANG J X , CAI N , SHENG Y. Cross-border Entrepreneurship of Focal Firms, Dual Platform Architecture and Industrial Cluster Ecosystem Upgrading—A Case Study of Jiangsu Yixing Environmental Hospital[J]. 2018,12(2):157-175.
10. SHEN S D , KANG X Q . Research on Industrial Chain Synergy Degree in Express and E-commerce Industry in Big Data Era[J]. The Journal of Quantitative & Technical Economics , 2018,35(7) : 41-58.
11. CHEN C , CHEN J H , GONG J , SUN S F. Stage characteristics and suggestions for the current new agricultural industry[J]. Research of Agricultural Modernization, 2018,39(1):48-56.
12. ZHANG Y H , YAN H , ZHUANG Z Z , LI, Z W . Can E-commerce Promote Innovation of Traditional Manufacturing?[J]. The Journal of Quantitative & Technical Economics, 2018,35(12): 100-115.
13. Yin, Kedong, Xu, Yao, Li, Xuemei, et al . Sectoral Relationship Analysis on China's marine-land economy based on a novel grey periodic relational model[J]. Journal of Cleaner Production, 2018, 197(01):815-826.
14. Zhang G , Jia H , Yang L , et al. Research on a Model of Node and Path Selection for Traffic Network Congestion Evacuation Based on Complex Network Theory[J]. IEEE Access, 2020, 8(01):7506-7517.
15. Zhang Z , Wang Y , Xie L . A Novel Data Integrity Attack Detection Algorithm Based on Improved Grey Relational Analysis[J]. IEEE Access, 2018, 6(99):73423-73433.