

Research on the Development Path of Ecological Agriculture Industrialization in Western China Based on E-commerce

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Abstract: The integration of urban and rural economic and social development is the fundamental way to solve the "three rural" problems, and the development of agricultural industrialization is the top priority in achieving the integration of urban and rural economies. Through combing the classic industrial theories and combining with the specific conditions of western China, this paper puts forward suggestions for effective paths for the development of agricultural industrialization in western China from the perspective of e-commerce. At the same time, the thesis makes a simple exploration of the production and management model of agricultural products, and summarizes the construction goals and functions of this agricultural product e-commerce system based on the analysis of farmers' needs for the e-commerce system. Through the writing and development of this agricultural product e-commerce system paper, an attempt is made to propose a solution of "Internet + rural business".

1. Introduction

The economic development history of various countries in the world shows that e-commerce is an effective way to coordinate the development of the three industries, promote the integration of urban and rural areas, and improve the overall level of a country's economy. In 2013, China's "Central No. 1 Document" pointed out that the integration of urban and rural development is the fundamental way to solve the "three rural" issues, and efforts must be made to build a new agricultural management system that combines intensive, professional, organized, and socialized. Narrowing the gap between urban and rural dual society, coordinating urban and rural development, and promoting the simultaneous development of industrialization, informatization, urbanization, and agricultural modernization in the process of e-commerce have become important measures for China's economic and social development in the post-financial crisis era. Mumford, a famous American urban theorist, pointed out that: the city and the countryside cannot be completely separated, the city and the countryside are equally important, and the city and the countryside should be organically integrated. At present, the biggest obstacle to increasing the overall development speed of China's economy lies in the urban-rural dual economic system, and the western region is the most typical region for urban-rural dual economic development. How to promote the integration of agriculture in the western region in the process of promoting the "synchronization of the four modernizations" The path to globalization, specialization, organization, and socialization, and the construction of a new agricultural management system are not only needed to bridge the urban-rural duality gap in the western region, but also to expand domestic demand, cultivate new economic growth points, and improve the overall development quality of the national economy. Dilemma needs. For this reason, it is particularly necessary to discuss the development of agricultural industrialization in western China from the perspective of e-commerce. At the same time, this paper attempts to build a platform for display and sales of agricultural products that can directly communicate with agricultural product consumers, so as to reduce

intermediate links, eliminate information barriers, and quickly realize the delivery of agricultural products from producers to consumers. , To stabilize the cost and income of agricultural producers, truly realize the market's leverage mechanism to guide production and lead consumption, and increase farmers' income to ensure consumer interests [1].

2. Concept discussion

2.1 Rural e-commerce

1) The concept of rural e-commerce

Rural e-commerce includes agricultural product e-commerce, and agricultural product e-commerce is mainly an electronic trade method in which agricultural products are exchanged. The concept of rural e-commerce is broader, as long as it is the transaction object or the subject of the transaction involving agriculture. Therefore, the products traded can be agricultural products, agricultural and sideline products, other products processed in rural areas, or One of the two parties to the transaction is from the countryside.

2) The concept of rural e-commerce industry cluster

The concept of rural e-commerce industry cluster is defined as: within a certain rural area, a large number of economic entities and related service organizations that are in or related to a certain characteristic rural industry field, with the application of e-commerce business model as the core, integrate, Innovate and enlarge the traditional rural industrial chain and value chain, and form an organic group integrating production, supply and marketing [2].

2.2 The era background of rural e-commerce development

1) Industry development trend

According to figures released by the National Bureau of Statistics, as of the end of 2016, my country's rural population was 674 million, accounting for 50.32% of the total population. The market is huge. From the perspective of the development trend of e-commerce, "new retail integrating online, offline, and logistics" and "intelligent, personalized and customized new manufacturing" have become industry consensus within a certain range, helping users save time, Helping users make professional choices and using brands to seize high points of public awareness have become the goals pursued by the Internet economy. The development of the domestic agricultural product e-commerce industry presents a development trend of "scale first, top and bottom interaction, single product leadership, reverse customization, and cross-border integration".

2) Policy Orientation

The Chinese government attaches great importance to rural work and the rural market. Guiding the work of "agriculture, rural areas and farmers" has become the main content of the Central Government's No. 1 document for many years. Policy orientation of business development. In 2015, the General Office of the State Council issued the "Guiding Opinions on Promoting the Accelerated Development of Rural E-commerce", which clearly proposed innovative rural business models, cultivated and strengthened rural e-commerce market players, and strengthened infrastructure construction.

2.3 Current status of agricultural industrialization in the western region

For a long time, due to the influence of many factors such as natural climate conditions, topography and landforms, water and soil resources in the western region of China, agricultural development has been extremely slow, single planting and breeding methods, simple business models, unreasonable industrial structures, and lack of conditions for achieving economies of scale. Shown in the following aspects.

1) Poor conservation of water and soil resources, special topography and landforms, agricultural cultivation is mainly based on traditional food and cash crops, and the development mode is single. The arable land is mostly mountain, woodland, slope land, dry land and mostly low-yield land, which is suitable for traditional labor-intensive farming methods. Affected by natural conditions,

agriculture in the western region not only has low yields and difficult farming, but also has a generally low level of productivity, excessively dispersed management methods, and a low degree of industrialization.

2) Affected by the "push effect" of agriculture and the contradiction between man and land, the agricultural labor force in the western region has a high degree of aging, low cultural quality, and insufficient pioneering spirit, making it difficult to enter new production resource elements. Most of the young and middle-aged labor force has actually been separated from the agricultural production field due to the influence of the urban "pull effect". The structural shortage of labor resources makes it extremely difficult to construct a new agricultural management system, which in turn restricts the development of regional agricultural industrialization.

3) The structure of the agricultural industry in the western region is maladjusted. The agricultural planting and breeding wins by quantity, the model is traditional, the brand awareness is poor, and it is greatly affected by market externalities. The blind imitation and follow-up phenomenon are serious, and the anti-risk ability is weak and difficult to form a scale effect. Agricultural products are mostly primary raw materials, with low added value and weak competitiveness. Although the agricultural sector is developing rapidly, the economic benefits are generally low, and the ability to boost farmers' income is poor, making it difficult to accumulate original capital for the development of agricultural industrialization.

3. Production efficiency of agricultural ecological industrialization in the western region

The evaluation of agricultural production efficiency is to take natural factors and labor force, economy and technology as the input of the system, and take food security, agricultural economic development, rural social progress, agricultural ecological environmental protection and governance as output, and the calculated data package Network analysis "efficiency evaluation index" can be used to measure the level of sustainable agricultural development of each county (city). The performance of agricultural production with county as a unit is mainly reflected in the level of productivity. Although production can be achieved through the expansion of production scale, the increase of production factors does not mean the increase of productivity. The increase in the level of productivity depends on the efficiency of the use of production factors and the increase in technological progress (that is, the production curve may shift outward). Production efficiency (TE) refers to the efficiency of input into output. In the absence of price information, the efficiency of resource allocation cannot be evaluated; TE can be decomposed into pure efficiency (PE) and scale efficiency (SE). Due to economies of scale and diseconomy, SE is an internal part of production performance, and technological progress is also an internal part of productivity growth. Technological progress refers to the movement of the production possibility curve outward from the origin. In the model using the distance function, MPI can be used for multi-input and multi-output analysis when there is no specific behavior goal (such as profit maximization or cost minimization). It can be divided into input type and output type. Under certain technical conditions, the distance function has been extensively discussed. Under each production condition, we can define output or input data envelopment analysis model. Assuming that K inputs and M outputs of agricultural production in N counties (cities) are obtained, for the j th county (city), that is:

$$\begin{aligned} x &= (x_1, x_2, x_3, \dots, x_k) \in R^{K+} \\ y &= (y_1, y_2, y_3, \dots, y_m) \in R^{M+} \end{aligned} \quad (1)$$

The technology set can be expressed as:

$$T = \{(x, y) : x \in R^{K+}; y \in R^{M+}\} \quad (2)$$

The input matrix of N state-owned forestry enterprises is $X=K \times N$ and the output matrix is $Y=M \times N$. The output MPI between time s and time t can be calculated using the following formula:

$$MPI(y_s, x_s, y_t, x_t) = \left[\frac{d_0^s(y_t, x_t)}{d_0^s(y_s, x_s)} \times \frac{d_0^t(y_t, x_t)}{d_0^t(y_s, x_s)} \right]^{1/2} \quad (3)$$

In the formula: $d_0^s(y_t, x_t)$ is the distance from the observation at time s to time t. If MPI is greater than 1, it indicates that the increase in TFP from time s to time t is positive, and vice versa, it indicates that the increase in TFP from time s to time t is negative. Value, (3) can be similarly expressed as an equivalent form of (4):

$$MPI(y_s, x_s, y_t, x_t) = \frac{d_0^t(y_t, x_t)}{d_0^s(y_s, x_s)} \quad (4)$$

$$* \left[\frac{d_0^s(y_t, x_t)}{d_0^s(y_s, x_s)} \times \frac{d_0^t(y_t, x_t)}{d_0^t(y_s, x_s)} \right]^{1/2}$$

In the formula: the part outside the brackets is the output type TE from time s to time t, and the part inside the brackets is the geometric average measurement output type TC based on the input of x_t and x_s using the production technology from time s to time t. In the case of constant economies of scale (CRS), the analysis diagram of a single input and output is shown in Figure 1. The counties (cities) in the western region have production point D at time s and point E at time t. The output of agricultural production in counties (cities) in the western region in each period is not higher than the maximum output of technology, which means that there are technical inefficiency factors at each moment.

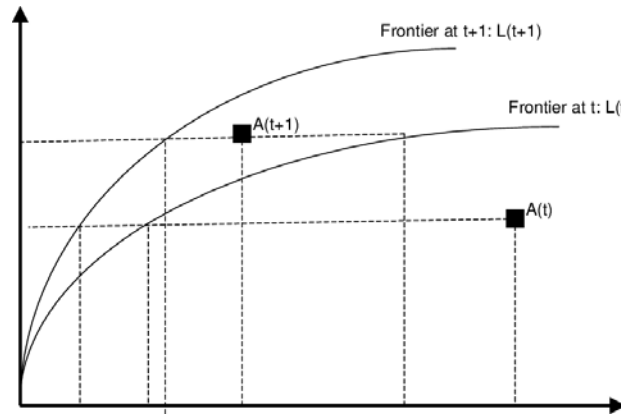


Fig.1 Schematic diagram of MPI productivity index

The measurement model of TFP is divided into input-type Malquist TFP model and output-type Malquist TFP model. The input type Malquist TFP calculates the distance ratio relative to the data of each county (city) in two periods under the same technical conditions. In order to obtain input type Malquist TFP.

4. Industrialization of Western Ecological Agriculture Development

4.1 Connotation

The industrialization of eco-agriculture refers to the principle of coordinating the development of the rural economy with the protection of the agricultural ecological environment, the development of natural resources and their value-added, and the coordination of protection and the realization of sustainable utilization, based on the carrying capacity of the ecosystem, and giving full play to local ecological advantages. Develop modern agricultural industries with high-quality, safe, and harmless agricultural products and high economic and environmental benefits on the basis of a virtuous ecological cycle. Eco-agriculture is based on the principle of coordination between the development of rural economy and agricultural ecological environmental protection, and the coordination of natural resource development and protection value-added. Based on the premise of the carrying capacity of the ecosystem, it gives full play to the local ecology, location advantages and comparative advantages of products. On the basis of a virtuous cycle of production and ecology,

develop high-quality, safe, and pollution-free agricultural products, and develop modern agricultural industries with high economic and environmental benefits. Through regional layout, specialized production, serialized processing, network links, integrated operations, social services, and corporate management, it integrates farmers (bases), high value-added processing companies, M leading companies, and large markets. They are closely and organically combined to form an entity of benefit sharing, risk sharing, and common development, so that the rural economy can embark on a virtuous circle of self-development, self-accumulation, self-restraint, and self-regulation. Figure 2 shows the basic form of ecological agriculture.

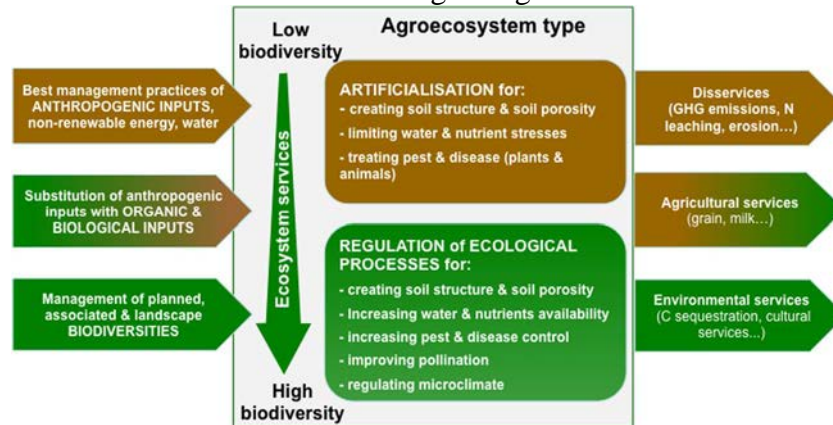


Fig.2 Basic form of ecological agriculture

4.2 The realization mechanism of ecological agriculture industrialization

The basic idea of eco-agriculture industrialization is to change the previous single-centered production model of agricultural production on the basis of eco-agriculture, and to further improve the system structure of eco-agriculture through the organic combination with agriculture and industrialization, and to adopt an efficient eco-agricultural industry the road to change. As an economic operation system, the industrialization of eco-agriculture has its own realization mechanism: the industrialization of eco-agriculture is based on agricultural production, based on decolonialization, guided by the market, centered on leading products, and constructed as a "production-processing" -A multi-level chained compound agricultural industry system that connects "Sales" and integrates "Agriculture-Industry-Trade". The realization of eco-agriculture industrialization results from the interaction of the basic elements of eco-agriculture under the guidance of established industrialization goals. Ecological agriculture mainly includes basic elements such as the endowment of agricultural natural resources, the level of agricultural economic development, the location conditions of agricultural production, leading products, organization and operation methods, and the agricultural industry chain. These elements interact to form the industrialized economy of ecological agriculture. System, and shows a certain system function: on the basis of regional agricultural natural resource conditions and economic and social conditions, with leading products as the center, carry out agricultural ecological production and industrial management, and finally realize the industrialization of ecological agriculture [3].

From the perspective of the system characteristics of ecological economy, the basic core of ecological agriculture industrialization lies in the ecological production and industrial management of agriculture. Ecological production follows the theoretical assumption that the production process is an energy balance, and the material energy in the production system is in a closed cycle. The input material and output material of this production system are basically equal in quantity and quality. A balanced agricultural production system can be a group of enterprises formed by a group of agricultural production projects. The main requirement of this enterprise group is that there must be one or more main output products in the entire system, and most agricultural production wastes and agricultural by-products can be used or digested anywhere and in time, turning the waste into saleable The useful resources are the aspirations of society and the environment, even including the economic field, to complete the process of ecological production. Industrialized management

describes the problem of product circulation and value realization after the ecological production link. A harmonious ecological agriculture system must have one or several core industries, as well as the industry clusters radiated by it. Various industries can form a distinct industrial chain through product processing procedures, and the production surpluses of upstream and downstream industries can constitute the industry. Food chain". This kind of connection between industries can be reduced through more than one material or energy, thereby realizing a continuous and steady cycle of material and energy between industries, and finally forming a number of agricultural and sideline products, which will reduce the residues formed in the agricultural production process. Ecological treatment within the system not only improves the efficiency of resource utilization, but also solves the pollution of the natural environment from agricultural production.

5. Establishment of an e-commerce platform for western ecological agricultural products

First of all, in order to improve user satisfaction, we believe that controlling the source of the product is the most critical link. Compared with the main e-commerce model, the direct procurement model at the origin is more suitable for the e-commerce system of agricultural products; secondly, in order to improve the difficulty in the direct procurement model of real estate Focusing on issues such as centralized picking, warehousing, and slamming transportation, we proposed an order-based e-commerce model based on the direct real estate procurement model. The use of an order-based e-commerce model based on the production base and the establishment of an e-commerce system for fresh agricultural products can ensure the quality of agricultural products through pre-sales and orders, while reducing product production and marketing risks, effectively improving user satisfaction, and stimulating users from different regions According to the information released for pre-sales, orders are issued to the base, and the "freshest" agricultural products are reserved, and the stocks are complete, and the base is uniformly distributed. This not only reduces logistics and warehousing costs, but also meets the "customized" needs of individual users [4].

5.1 Overall design

"Order agricultural products e-commerce system" mainly includes five modules: "order management", "commodity management", "member management", "system setting" and "payment management". As shown in Figure 3.

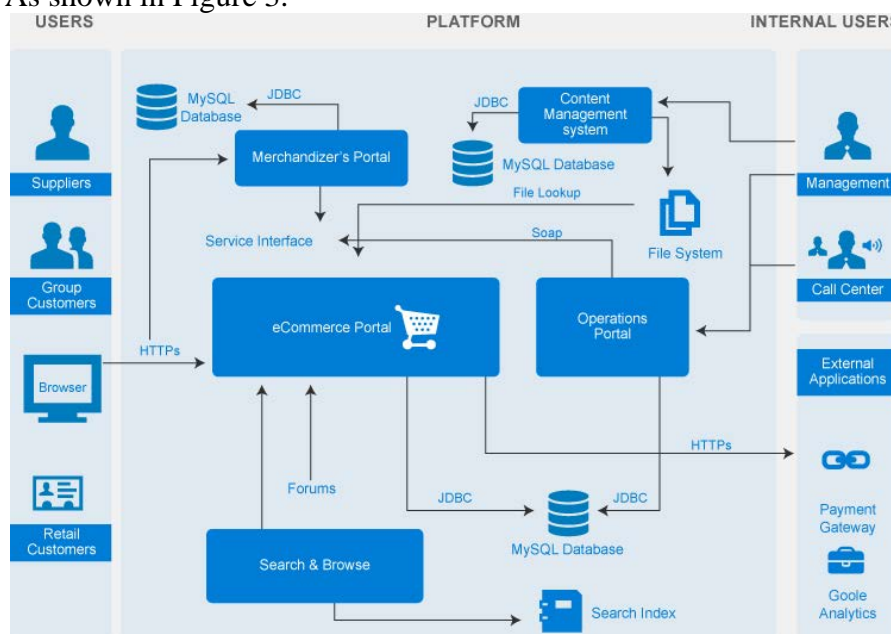


Fig.3 E-commerce platform for agricultural products

1) Order Management Module

When the buyer purchases the goods, the order management front desk will record the buyer's

various needs in the order in detail, so that the seller can provide the buyer with the conforming goods. Front desk order information includes order number, creation time, seller information (user name, store name), product information (product name, product specification, product quantity, product price), delivery address, product operation (refund/return, application for after-sales), actual payment, transaction status (waiting for buyer to pay, waiting for seller to ship, expert shipped, transaction successful) and transaction operation (pay immediately, pay the balance, confirm receipt, cancel order). The order management background supervises and manages the execution of the orders accepted by the store. The administrator can view the details of the product transaction, and can also notify the buyer and seller of the timely payment and delivery by email. Back-end order information includes order number, order status, price, buyer, order time, operation (send email, edit order information, delete).

2) Commodity Management Module

The merchandise management front desk will ask the seller to fill in all kinds of information about the goods to be sold in detail, which will be released for buyers to browse and purchase. Product information includes basic product information (commodity category, product type, product attributes, product title, subtitle, keywords, price, product quantity, product picture, product description), logistics information (logistics weight, shipping), after-sales guarantee information (Invoice) and other information. The product management background will record list product information (products can be divided into all products, illegally removed products, and products to be reviewed), and can review, recommend, edit, and rank products; you can view user inquiries on products and help The seller may remind the seller to reply to inquiries; can view or retrieve product reviews; provide product configuration, including classification management, brand management, type management and management.

3) Member Management Module

Manage the information and platform of all users (individual users, enterprise users) registered in the system. In the member management front desk, individual users only need to set a user name and password, and accept the platform agreement to become a member; in addition to setting the user name and password, corporate users also need to upload relevant certificates such as business licenses for record. The member management background can assign member permissions, manage, review, and send emails; you can view member feedback issues; you can view short messages between members.

4) System Setting Module

Make administrator settings, manage friendship links, emails and notifications. Administrator setting functions include adding and editing authority groups, adding and editing administrators, modifying login passwords and background operation logs. The function of managing friendship links includes adding the link sorting of friendship websites. Mail management functions include editing of mail templates, group member mailing and announcement management.

5) Payment Management Module

Including payment method setting, payment account management, member withdrawal management, recharge card management, member fund details and system fund functions. Payment method setting the administrator sets the opened online payment, setting the payment name, description, account number of the payment method interface, verification code, cooperation identity and other information. The payment account management administrator can view the amount information of all payment accounts, and can also manually recharge members. The member withdrawal management administrator can view and accept member and enterprise users' applications for withdrawal. The recharge card management administrator can automatically generate a certain amount of recharge card, and manage the operation of the recharge card. The member fund details administrator can check the fund changes of all members of the website, and can recharge users. The total fund data of the entire website calculated by the system fund manager, the total amount of the account, the frozen property, the amount in the transaction, and the website sales [5].

5.2 Pre-sale (order) function

The base/farmers use the pre-sale (order) function to release the agricultural product information of the base in advance, and disclose the agricultural product information to the market. Users can reserve according to their needs. When the product matures, the e-commerce system informs the user to pay the balance and summarizes the pre-sale (After the order) information, picking, processing, sorting, and stocking are completed, distributed by the logistics company, and delivered to the user. This not only expands sales channels, reduces product sales risks, and effectively improves the problem of small production that is difficult to match the large market, but also eases storage and transportation difficulties to a certain extent, and improves customer satisfaction. As shown in Figure 4.

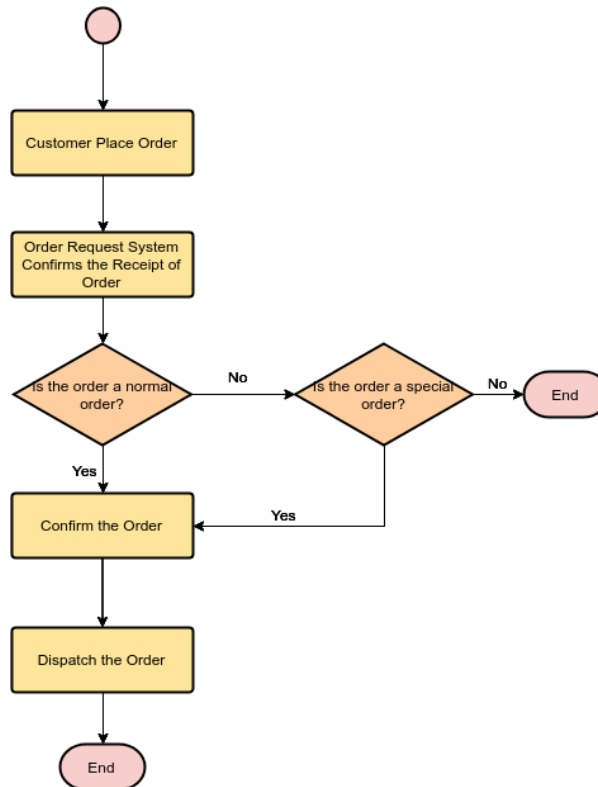


Fig.4 Pre-sale flow chart

5.3 Production tracking

The information flow of fresh agricultural products from picking, processing/packaging, warehousing, and transportation is open to users, so that the entire agricultural product supply chain can be tracked, and users can understand the status of customized products. In order to realize the seamless connection of the entire agricultural product supply chain, information flow has become the key. The information flow of the production tracking of the order agricultural product e-commerce system not only provides users with necessary status information, but also a standardized information flow (such as the EAN UCC system), which identifies all links in the supply chain, and realizes the collection and accurate recording of information flow data. On the one hand, it improves the accuracy of tracking and tracing information, and on the other hand, it urges China's agricultural products to meet the strict requirements of international food safety and improve product quality.

5.4 Delivery

Since agricultural products have a fresh-keeping time limit, there are high requirements for transportation links. How to reduce intermediate links, shorten transportation time, reduce losses, and balance transportation costs and products has always been the biggest problem in transportation

and delivery. In order to ensure that the agricultural products produced in the base maintain the freshest and most authentic state in the hands of users, the transportation and delivery of the order agricultural products e-commerce system adopts the third-party cold chain distribution mode, and with the help of professional third-party logistics, low-temperature transportation and low-temperature distribution will be pre-empted. Cold processed and packaged agricultural products are delivered to users. The system will provide a query and application interface from the production link to the transportation and delivery link. You only need to set it in the background to track the product status synchronously [6].

5.5 Credit Evaluation

In order to ensure the quality of the platform's products, supervise and standardize the behavior of users of buyers and sellers, a credit evaluation mechanism has been set up on the platform. Credit evaluation is divided into two parts: credit score and evaluation content. Reputation points are generally automatically generated by the system and do not need to be changed. If you need to change the point range, you can adjust it in the background of the system. In the reputation points, the seller's reputation points will increase by 1 point for every good comment obtained; if the seller is given a bad review, the reputation points will be deducted by 1 point; if it is given a medium review or neither the buyer nor the seller has any comments, the reputation points will not change. The evaluation content is mainly based on the quality of the product, the seller's service attitude and the logistics speed as the evaluation indicators. The seller can evaluate the product with pictures and texts. It can describe the product in words or upload pictures. There are pictures and truthful evaluations.

6. Conclusion

The development of agricultural industrialization not only affects the degree of economic and social development in the western region, but is also of vital importance for the western region to follow the path of simultaneous development of the "four modernizations". For this reason, it is discussed that the development of agricultural industrialization in the western region from the perspective of e-commerce has strong practicality and guidance for the western region.

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