

# Analysis on the Practical Logic of Agricultural Product E-commerce Platform Ecosystem under the Framework of Reconstruction and Regeneration

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**Abstract:** In the context of the development of "multi-chain integration" and "digital village", this paper is based on ecosystem theory, synergy theory, and dynamic capability theory, and constructs agricultural products electricity from four aspects: environmental attributes, structural analysis, operation mechanism, and platform goals. The theoretical analysis framework of the business platform ecosystem, and explore new ideas, new dimensions and new paradigms of the agricultural product e-commerce platform ecosystem. This paper believes that the agricultural product e-commerce platform ecosystem, as a system of resource integration, multiple symbiosis, multi-chain integration, and risk sharing, has weak adaptability to the external environment, unreasonable benefit distribution mechanism, difficulty in extending the industrial chain, and lagging information platform construction. Multiple Lockdown" dilemma. Based on this, it is proposed to realize the ecological, clustered and large-scale development of the e-commerce platform ecosystem from four aspects: integrating resource advantages, optimizing the external environment, extending the service chain, and building a reasonable profit distribution mechanism.

**Keywords:** Agricultural products e-commerce, Ecosystem, E-commerce platform, Ecosystem.

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## 1. Introduction

The development of rural e-commerce has important strategic significance for promoting the reshaping of agricultural value chain, increasing agricultural income and high-quality agricultural development. The 2020 Central Document No. 1 clearly proposes to "effectively develop the rural market and expand the coverage of e-commerce in rural areas", and support the organic connection between small farmers and modern agriculture through the construction of comprehensive demonstration areas for e-commerce into rural areas. Agriculture, as a weak industry, has pain points, difficulties and gambling points that hinder farmers' income increase, such as transaction information asymmetry and blocking of upstream and downstream purchase and sales channels. ring. Under the background of "Internet + Digital Village", due to the relative lag of rural information, imperfect infrastructure, insufficient government support, lack of e-commerce talents, and lack of coordination between e-commerce platforms, the e-commerce platforms are faced with homogeneous competition. A series of development problems such as aggravation, low degree of resource sharing, and imperfect profit distribution mechanism, how to realize the ecological, clustering, large-scale and synergistic of the e-commerce platform has become the basic foothold to solve the problem of e-commerce development. With the continuous improvement of the popularization and promotion of "Internet +" and digital information technology in rural areas, the continuous improvement of rural infrastructure construction, and the optimization of human capital structure, my country has ushered in an important period of strategic opportunity for the development of rural e-commerce in China [1]. In 2017, the State Council issued the "Guiding Opinions on Promoting the Development of Rural E-commerce", which will promote the development of rural e-commerce as the focus, direction and breakthrough point to solve the "three rural" problems, how to solve the adaptation

of agricultural products e-commerce platform and the external environment Problems such as weak nature, unreasonable benefit distribution mechanism, difficulty in extending the industrial chain, and lag in the construction of information platforms have become the key to increasing farmers' income, empowerment and efficiency. Therefore, under the background of "Internet +" and "Digital Village", this paper builds an e-commerce platform for agricultural products from four levels of environmental attributes, structural analysis, operating mechanism and platform goals based on ecosystem theory, synergy theory, and dynamic capability theory. The theoretical analysis framework of the ecological circle, explore new ideas, new dimensions and new paradigms of the agricultural product e-commerce platform ecosystem, use the economic "internal circulation system", and use the e-commerce informatization platform to realize the poverty-stricken people get rid of poverty and become rich, and promote the e-commerce enterprise industry Chain, supply chain and value chain reshaping, in order to provide experience and reference for rural e-commerce development and rural revitalization[2].

## 2. Ecosystem of Agricultural Products E-commerce Platform

Analysis With the continuous expansion of the breadth and depth of the integration of the digital economy and the agricultural field, the competition model, operation management model, and benefit distribution model among e-commerce platform enterprises have become more complex. The upstream and downstream enterprises linked by the value chain are highly Convergence, the boundaries of behavior between enterprises are becoming more and more blurred. In this context, it is an urgent task for current theoretical research to construct a complete analysis framework of the agricultural product e-commerce platform ecosystem. Therefore, this paper attempts to reveal the operation mechanism and practical logic of the agricultural product e-commerce

platform ecosystem from the perspective of ecosystem theory, in order to solve the problem of the disconnection between the theory and practice of agricultural product e-commerce development [3].

## **2.1. Characteristics of the Ecosystem of Agricultural Products E-commerce Platforms**

There are many participants in the agricultural product e-commerce system, and various stakeholders form a symbiotic relationship of information interaction, resource sharing, and risk sharing through information coordination, organizational coordination, resource coordination, and logistics coordination. In comparison, the e-commerce ecosystem of agricultural products has the following typical characteristics.

(1) Features of resource integration. The traditional e-commerce platform model is limited by factors such as operation management mode, business scale, and information barriers, and it is difficult to form a scale effect. The agricultural product e-commerce ecosystem integrates advantageous resources within the ecosystem and supply chain, and faces fierce market competition. Gather together to obtain large-scale and wide-ranging economic effects and network radiation effects, and realize resource integration and channel integration in the entire process of agricultural production, sales, transportation, and settlement.

(2) Multiple symbiotic characteristics. Although the participants in the agricultural product e-commerce ecosystem are in different positions, the participants are both interconnected and compete with each other under the action of common interests. Within the ecosystem, due to the scarcity of resources, various participating entities will compete for resources, for example, intermediaries in key groups will compete for cooperation with platform companies. At the same time, each participant also has a cooperative relationship. For example, enterprises in the upstream and downstream of the ecological chain in key groups will cooperate with each other to reduce costs and improve efficiency, and then seek to maximize benefits. In short, there are multiple stakeholders in the ecosystem, and dynamic balance is achieved through the network connection relationship; the members of the ecosystem form a relationship of mutual assistance and mutual promotion, forming a superimposed scale effect [4]; the members of the ecosystem have common interests and visions Value-based strategic cooperation.

(3) Multi-chain fusion features. The components of the platform ecosystem are composed of a multi-chain integration formed by supply chain, industrial chain and value chain; farmers directly sell their agricultural products to e-commerce platforms or farmers sell agricultural products to middlemen and then to e-commerce. Platform enterprises are ultimately sold by e-commerce platform enterprises to final consumers, which reflects the system of the supply chain; relevant cooperation between different industries such as e-commerce platform enterprises, logistics companies, financial companies and advertising companies reflects the industrial chain system; The interconnection between different participants is based on their common interests, and they are all to maximize their respective interests, which reflects the value chain system[5].

(4) Features of risk sharing. The entire internal link of the agricultural e-commerce ecosystem can be seamlessly connected with strong connectivity. At the same time, by

building an information platform system, upstream and downstream enterprises in the supply chain can realize information sharing, and grasp the information of agricultural products in processing, production, circulation, distribution, warehousing and other links throughout the process, so as to facilitate timely decision-making [6]. Due to the harmonious symbiosis of the e-commerce system, the upstream and downstream industrial chains form a close interest linkage mechanism, which can effectively avoid conflicts of interest, information asymmetry, and lack of cooperation among members of the supply chain, forming a stable risk sharing mechanism.

## **2.2. Theoretical Analysis of the Ecological Circle of Agricultural Products E-commerce Platform**

The dynamic capability theory is the capability of an enterprise to establish, integrate and reconstruct the internal and external resources of the enterprise in response to the rapidly changing internal and external environment. This paper builds the analysis framework of the platform ecosystem based on the dynamic capability theory. The agricultural product e-commerce ecosystem is based on the hard and soft environment, with platform companies as the leader and its own business as the core. There are multiple stakeholders in the ecosystem, and dynamic balance is achieved through network connections. The members of the ecosystem form a relationship of mutual assistance and mutual promotion, share common interests and visions, and carry out strategic cooperation based on common values. The operation mechanism of the agricultural product platform ecosystem is that the participating entities form a competitive and cooperative relationship in order to achieve agglomeration scale effect under the connection of interests. Driven by Internet technology and government policies, the goal of resource sharing, complementary advantages and co-evolution is finally achieved [7].

(1) Environmental attributes. The operation of the e-commerce platform ecosystem is inseparable from the support of the environmental system. As an open and evolving system, the e-commerce ecosystem constantly exchanges materials, information and capabilities with the external environment. Environmental factors are the basic premise for the functional attributes of agricultural products e-commerce system and the network spillover effect. The soft environment composed of economic and social development. Through environmental scanning, the influence of factors such as institutional environment, social development, technical level and resource elements on the agricultural product e-commerce system is analyzed [8].

(2) Structural analysis. The e-commerce ecosystem takes the enterprise as the main body, the industry as the support, the interest connection as the link, and the electronic payment and mobile payment as the medium. The core platform enterprise is the leading group. By providing platform users with various services, it is the main link connecting various groups, and is responsible for integrating ecosystem resources and coordinating the relationship between various groups; the original group mainly refers to the vast number of farmers who provide the original agricultural products. They provide the initial agricultural products for the core e-commerce enterprises. The original species is the source species that other species can exist in, and is in the original source position; the e-commerce platform ecosystem should include suppliers,

buyers, retailers and other supporting species; the parasitic species mainly include Affiliated value-added enterprises refer to enterprises that rely on providing auxiliary services for core enterprises to survive [9]. The existence of parasitic populations is conducive to the optimization of the ecological environment.

(3) Operation mechanism. The e-commerce platform ecosystem refers to the affiliated enterprises and organizations around the core B2B e-commerce platform in a certain social, political and economic environment, using the platform as a link to build a network of competition and cooperation in various forms, through resource sharing, complementary advantages [10]. The organic whole composed of co-evolution achieves the effect of strengthening agriculture and increasing income. The agricultural product e-commerce ecosystem is a system integrating information flow, logistics and capital flow, forming an open platform ecosystem and realizing a self-circulating system. By integrating resources, it provides online transactions, online financing, online High-quality services such as information sharing and offline logistics services can not only improve the operation efficiency of each participant in the platform ecosystem, provide credit guarantee and financial support, but also greatly reduce their operating costs, ultimately achieve resource sharing, and exert accumulation effect and scale effect.

(4) Platform goals. Based on the different resource advantages of different participants, the competition and cooperation mechanism within the platform ecosystem can not only strengthen the cooperation intention among the participants, but also improve the enthusiasm of the participants themselves, and is also conducive to satisfying the diversification and individuality of user needs, and low cost and high value. In the ecosystem, achieving a win-win situation is a process of mutual interaction, and the ultimate benefits are jointly created by consumers and enterprises. Consumers are the meaning and driving force of enterprise value creation, and the intermediate organization resource belt composed of suppliers and platform application providers provides relevant resources. The core business or capabilities of many participating entities are different. Through the complementarity of resources, the effect of "1+1>2" can be achieved to achieve the purpose of adding value, so as to achieve a win-win effect for all parties, and realize resource sharing, complementary advantages and co-evolution [11].

### **3. The Dilemma of Cultivating the Ecological Circle of Agricultural Products E-commerce Platform from the Perspective of "Digital Village"**

Under the development background of "multi-chain integration" and "digital village", traditional e-commerce enterprises are faced with multiple uncertainties such as homogeneous competition, difficulties in extending the industrial chain, coordination risks and informatization risks, and ecologicalization has become the development trend of enterprises, through the construction of the agricultural product e-commerce platform ecosystem, to give full play to the synergistic effect and network radiation effect of the platform ecosystem. Although my country's agricultural product e-commerce platform is in a stage of rapid development, it is constrained by factors such as the external

environment, benefit distribution mechanism, rationality of population structure, and information platform effectiveness. A virtuous circle and economic efficiency play.

### **3.1. The Compatibility Between the External Environment and the Ecosystem of Agricultural Products E-commerce Platforms Is Weak**

The environmental factors of the agricultural product e-commerce platform ecosystem include not only the hard environment such as transportation, logistics communication, and network accessibility, but also the soft environment such as the institutional environment, laws and regulations, and social environment. The outstanding problem at present is that the external environment and the ecosystem of agricultural products e-commerce platform are weak in adaptability [12]. First of all, from the perspective of the hard environment, with the construction of "digital villages" in my country, the level of informatization in rural areas has been continuously improved, but the shortcomings of network facilities and logistics and transportation systems are still the issues that farmers are most concerned about when developing rural e-commerce, "Although the "Every Village Connects to the Internet" initiative has increased the Internet penetration rate in rural areas in China, the perfection of network facilities in some remote rural areas has become a key factor restricting the development of the agricultural product e-commerce platform ecosystem. Secondly, from the perspective of the soft environment, based on the theory of planned behavior, the institutional incentives in the external environment restrict the behavioral choices of decision-makers. As rational economic persons, the decision-making of farmers' e-commerce technology adoption behavior is inevitably affected by the external environment. The dominant institutional environmental factors will directly or indirectly affect farmers' willingness to participate in e-commerce technology. Compared with urban areas, rural areas have natural weaknesses in terms of information services, transportation, logistics costs, and financial support. In addition, the government has shortcomings in financial support, technical training, information services, and freight subsidies, resulting in the external environment. The weakening of the supporting role for the e-commerce platform ecosystem of agricultural products has restricted the growth of emerging formats such as the e-commerce platform ecosystem to some extent.

### **3.2. The Internal Interest Distribution Mechanism of the Population Structure Is Unreasonable, And A Risk-Sharing Community Has Not Been Formed**

The operation of the agricultural product e-commerce platform ecosystem is inseparable from the harmonious symbiosis and synergy of the leading populations, original populations, key populations, supporting populations and parasitic populations within the system. The current leading populations are in an oligopolistic position, responsible for integrating ecosystem resources and coordinating various group relationships. The original populations with the majority of farmers as the core are in a subordinate position and have weak market bargaining power [13]. The affiliated enterprises that provide support for the normal operation of the platform, such as logistics companies, financial platforms

and other supporting groups, do not interact closely with the upstream and downstream groups within the integrated ecosystem, and there is an unreasonable distribution of benefits in the entire agricultural product e-commerce value chain. A reasonable and orderly benefit distribution mechanism is the premise to ensure the normal operation of the e-commerce system. Since the original ethnic group with farmers as the main body is in a subordinate position in the market, it is in a relatively weak position due to factors such as specialization, organization and information channels, which undermines the enthusiasm of farmers to participate in e-commerce platforms. In the support group, the integration of logistics enterprises, financial enterprises and e-commerce platforms is not close enough, and the high logistics cost and financing difficulties limit the rapid development of the entire system. The current benefit distribution mechanism of the e-commerce ecosystem does not take into account the market position and risk-taking ability of various groups, and has not yet formed a community of interests sharing risks. Therefore, only by realizing the reasonable distribution of the interests of the participating groups in the ecological platform circle and creating a harmonious situation of multi-dimensional symbiosis, can the sense of belonging of various groups to the platform ecosystem be enhanced.

### **3.3. The Supply Chain, Industrial Chain and Value Chain of The E-commerce Platform Ecosystem Need to Be Further Extended**

In terms of supply chain optimization, the current agricultural product e-commerce platforms are in a state of fighting each other. There is no effective interest linking mechanism between platforms and platforms, and between upstream and downstream enterprises on the platform. Industrial chain, thus limiting the space for supply chain optimization and the exertion of scale effect. In terms of industrial chain extension, finance and logistics, as supporting groups, need to focus on building and improving supporting financial logistics services, and improving the stickiness and integration of the entire ecosystem by strengthening supporting financial logistics services, so as to strengthen the supporting chain. At the same time, platform companies mainly carry out ecological layout from both internal and external aspects. Internally, they mainly focus on user needs, develop core businesses, and continuously optimize the organizational structure, so as to enrich the members of the ecosystem, increase the number and scale of biological populations, and realize the internal structure. optimization and dynamic adjustment; externally, new opportunities are continuously explored, and enterprise boundaries are expanded through mergers and acquisitions, investment, etc., until an open and borderless ecosystem is formed. The development and growth of key groups in which intermediaries and consumers are located has fostered a favorable market environment and attracted the participation of various groups. Therefore, the existing agricultural product e-commerce platform ecosystem has shortcomings in supply chain, industrial chain, value chain, etc., which restrict the growth of new e-commerce formats and the exertion of value-added functions.

### **3.4. The Construction of the Information Platform Is Relatively Lagging Behind, And There Is A Large Room for Improvement in the Information Transmission Function of The E-commerce System**

The agricultural product e-commerce ecosystem is a system integrating information flow, logistics and capital flow. Information, as a scarce element resource, provides high-quality services such as online transactions, online financing, online information sharing, and offline logistics services. It can not only improve the operation efficiency of each participant in the platform ecosystem, but also provide credit guarantee and financial support. However, the current agricultural product e-commerce ecosystem generally has problems such as the relative lag in the construction of information platforms, which greatly increases the transaction costs and operating costs of the platform, and cannot achieve the goal of resource sharing and co-evolution. The information barriers within the e-commerce platform system cannot efficiently integrate the resources of all parties, and its main bodies mainly include government departments, technical institutions, financial institutions, non-financial institutions and traditional enterprises, which is not conducive to the formation of an open platform ecosystem and self-circulating system.

## **4. Path Optimization of Agricultural Product E-commerce Platform Ecosystem Based on "Internet +"**

This paper studies the path of the agricultural product e-commerce ecosystem, provides a new perspective for the formation of the agricultural product e-commerce ecosystem, enriches the related research on the e-commerce platform ecosystem, and provides a new thinking direction for the ecological development of enterprises. With the development and application of information technology and the Internet, the needs of consumers have become diversified and personalized, and the social division of labor system has become more and more refined. This makes e-commerce platform companies to innovate based on user needs, constantly meet the diverse needs of consumers, and formulate a win-win platform strategy. Only in this way can we obtain sustainable competitive advantages and perfect profit channels. In order to optimize the development environment of the e-commerce ecosystem of agricultural products and strengthen the benign interaction and coordinated progress of the participants in the ecosystem, the following suggestions are put forward.

### **4.1. Strengthen the Construction of Information Platforms and Create An E-commerce Platform Ecosystem for Information Sharing**

Information is an important resource for the development of rural e-commerce. By building an information service platform, it actively promotes information sharing and interconnection among supply chain nodes in the e-commerce platform ecosystem, effectively reducing transaction costs and improving the speed and efficiency of information dissemination. Build a modern information management

system, strengthen the ability to collect and organize information in the Internet of Things environment, and improve the Internet of Things technology system, so as to effectively alleviate the node risk and information asymmetry risk in the development of the agricultural product e-commerce platform, and realize the timely sharing of risk information by each node. Effectively curbing the spread and transmission of risks between nodes can realize the sharing of knowledge and resources among farmers, the complementarity of organizational advantages, and the improvement of management and marketing capabilities, which is conducive to the popularization and promotion of rural e-commerce. Build an information resource sharing platform. By integrating social resources, establish a regional e-commerce center for agricultural products, improve information consulting, technical services, warehousing and logistics and other e-commerce public service capabilities, and integrate business users' business flow, logistics, capital flow and information flow into the platform. Database, so as to provide consumers with more reliable, more targeted services.

#### **4.2. Optimize the External Environment and Create An Efficient and Collaborative Supply Chain Platform Ecosystem**

External environments such as transportation and network facilities are important factors that affect farmers' willingness to adopt e-commerce technologies. With the steady progress of the national "Every Village Internet" project, the Internet penetration rate in rural areas has increased significantly, but in remote areas where economic development is relatively lagging. In rural areas, network bottlenecks are still the key to restricting the development of rural e-commerce. Therefore, the government has increased its support for rural network infrastructure, continued to reduce taxes and fees, speed up and reduce fees, and improve the speed and efficiency of information dissemination; provide Internet coverage and service efficiency; improve the rural logistics and transportation system to reduce logistics and transportation cost, by integrating regional logistics express resources, to provide farmers with convenient and efficient modern logistics services; formulate relevant preferential subsidy policies for the e-commerce industry, optimize the external institutional environment, and relevant departments should increase policies on core elements such as capital, technology, and talents. Support efforts, optimize and improve the top-level design of the rural e-commerce development system, and continuously improve the level of coordination, informatization, and industrialization of rural e-commerce.

#### **4.3. Extend the E-commerce Value Chain and Create A Supply Chain Platform Ecosystem That Preserves and Increases Value**

As the core of e-commerce platform enterprises, it is necessary to cooperate with banks, online payment platforms and logistics companies to incorporate the business flow, logistics, capital flow and information flow of enterprise users into the platform database, so as to provide consumers with more stable and reliable, more targeted services. The main business of the agricultural product e-commerce platform is the sale of agricultural products. In order to meet the diversified needs of customers and increase the sales of

agricultural products, it is necessary to carry out deep processing of various agricultural products, which can not only increase the income of farmers, but also increase the sales of platform enterprises. , and can meet the diverse needs of consumers, and provide support for the development of the agricultural product e-commerce platform ecosystem from the supply side.

#### **4.4. Build A Reasonable Profit Distribution Mechanism and Create A Symbiotic and Win-Win E-commerce Platform Ecosystem**

A reasonable profit distribution mechanism is conducive to mobilizing the enthusiasm of various groups in the ecosystem, and better exerting the information transmission, value appreciation and resource synergy effects of the e-commerce ecosystem. The collaborative governance of the agricultural product e-commerce ecosystem should be based on the distribution of interests, and create an open, cooperative, harmonious and orderly atmosphere, thereby increasing the possibility of cooperation among members. Encouraging the strengthening of deep-level cooperation among various entities. Compared with shallow-level cooperation, deep-level cooperation can bring more value to partners, and can realize the sharing of knowledge and resources, the complementation of organizational advantages, and the improvement of management and marketing capabilities. Improve the business ecosystem and the theory of common values, speed up the turnover of information flow, capital flow, and logistics, sort out the various interest-linked entities in the ecosystem, and use the e-commerce platform ecosystem to achieve resource sharing and synergy. Through the rational distribution of the interests of participating groups in the ecological platform circle, a harmonious situation of multi-dimensional symbiosis will be created, and the ecological circle and cluster development of the e-commerce platform circle will be promoted.

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