Research on the E-business Platform of Agricultural Products and Rice Marketing Channel based on Network Big Data

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Abstract: Agricultural products marketing network resources have many advantages, such as large data makes the agricultural marketing environment has changed dramatically, e-commerce platform also provides a new sales channel. In this paper, the author analyses the E-business platform of agricultural products and rice marketing channel based on network big data. Through big data technology, agricultural enterprises can collect information at low cost, and make real-time analysis of the interests and preferences of consumers, and then to carry out precision marketing of agricultural products. Through empirical analysis, we analyse the performance of rice distribution channels, and the results show that the overall circulation performance of the E-business distribution channel model is better than the traditional distribution channels.

Key words: E-business platform, Agricultural products, Rice marketing channel, Big data

1. INTRODUCTION

Big data is after networking, cloud information technology industry and an important technological change, this change also accelerated the process of agriculture and traditional agriculture to modern agriculture, agricultural information conversion and digital, network marketing of agricultural products is a key step in this process(Anand,2010). The United States National Science Foundation will the data is defined as scientific instruments, generating sensing devices, Internet trading, e-mail, video software, web click stream data source such as large-scale, diversified, complicated and long-term distributed data sets(Niklas,2003; Druehl,2001). In the big data environment, consumer psychology and behavior patterns of agricultural products have changed a lot, which in the shopping process more personalized, active, social and mobile(Kim,2009). Agricultural products marketing to make every customer knowledge increase, the difference increases the value of information is sparse, and continuously improve customer relationship management cost; in massive database and big data platform for the foundation and support, marketing strategy, marketing mix and marketing effect evaluation and other aspects of the innovation of traditional marketing mode, the construction of large data environment the agricultural product precision marketing mode.

Since the reform and opening up, happened to turn the world upside down changes in China's agricultural products, agricultural products, especially the total rice production and constantly refresh the historical record, the production technology is becoming more mechanized, science and technology, the production efficiency is greatly improved, species diversity, although supply fluctuations occur occasionally, but also cause structural or seasonal factor(Park,2003). Overall, the development of the field of agricultural products has ushered in a new period of historical change. But on the other hand, there are still some problems in the field of agricultural products circulation, but also these problems led to the market supply and demand of agricultural products is not stable, structural surplus, price volatility and so on(Cattani,2006). Mode of different circulation channels plays a different role in circulation, with the production capacity of agricultural products increased and the market demand continues to diversify, circulation of agricultural products also will be accompanied by the integration, reform and innovation. The traditional mode of distribution channels and circulation of agricultural products in emerging markets is not able to meet the diverse needs of consumers, and the mode of agricultural products circulation channel model is still in the exploratory stage is not fully mature, the need for further innovation and improvement. In the circulation of agricultural products in the field of traditional agricultural products circulation channels and new distribution channels of agricultural products play a certain role, in order to further improve and improve the efficiency of agricultural products circulation, circulation of agricultural products circulation channel performance evaluation has become an urgent need to solve the problem.

2. ELECTRONIC COMMERCE AGRICULTURAL PRODUCTS PLATFORM

Agricultural products business platform is mainly for agricultural products processing, agricultural sales and other information released and related network information collection, network marketing is an important platform and media(Huang,2013). The category of agricultural products business platform to construct the B2C model belongs to change the traditional business mode of agricultural products sales, and gradually realize the network marketing of agricultural products, and provides an important support for China's agricultural products
production and sales of modern and integrated development, but also an important way of realizing the increase of farmers’ income and expand the sales channels.

In the process of the times and social progress and development, the production of agricultural products not only for the individual needs of life, but the beginning of product development, has become an important means to rely on the sale of agricultural products to increase farmers income. If the farmers rely on individual power processing production of agricultural products, there are many limitations, the main problem is that the sales channel (Jutla, 1999). Farmer groups try to set up the agricultural products sales cooperation management organization, and then realize the overall market competitiveness of agricultural products production and sales. According to our country's agricultural products related sales policy analysis can be found, mainly through the construction of agricultural products sales network platform to achieve product sales. Through electricity suppliers trading platform and trading pattern analysis can be found, agricultural market network resource sales have many advantages (Yao, 2005). Should promote the transfer of agricultural products through agricultural products business platform. The construction of B2C model can effectively realize the network connection and information sharing between the professional development and cooperation organization of agricultural products, and it can provide convenience for the supply and demand of agricultural products.

Authentication management subsystem: Certification management is mainly for the various types of system registered members, the need for farmers’ cooperative organization and management, including the customer's password, as well as login identity and other real information authentication.

Information publishing subsystem: The system is mainly for the use of membership platform regularly update the latest national network of cooperative policy, as well as the news market, can help farmers to use electronic business platform to find the latest information, but also can understand and learn the new planting and breeding production technology and agricultural products supply and demand information, can be convenient for farmers to understand and learn the latest information network.

Online shop subsystem: This system mainly introduces the basic information of the farmer specialized cooperative organization and the product information of each kind of main management.

Network electronic business subsystem: Online business subsystem is mainly for the registration of
farmers to carry out agricultural network sales of agricultural products, to play a agricultural product promotion, certification information management, agricultural products, order delivery, as well as payment and settlement. We can use this system to realize the real network marketing of agricultural products.

5) Intelligent information matching system: If there is no suitable product to find the process of businesses use the network platform of agricultural products required for product search, you can actively contact the network platform service personnel, individual orders demand information recorded, then gathering the appropriate product information platform by customer service personnel, in accordance with the selected conditions of agricultural cooperatives. Customer service will be part of the customer product demand information and agricultural cooperatives information for docking, to coordinate the promotion of transaction.

Figure 3. E-commerce platform

3. CIRCULATION MODE OF AGRICULTURAL PRODUCTS UNDER THE BACKGROUND OF NETWORK

3.1. Rice distribution channel analysis

The circulation of commodities with the sale of goods, since the transaction, or the exchange, the commodity exchange activities will inevitably involve the sale of goods, the seller and the buyer places, exchange, and the exchange and service factors to regulate this kind of exchange behavior. Therefore, the circulation of commodities must be combined with a series of elements of circulation, thus forming the so-called circulation system. The circulation system refers to the organic unity of the goods or services from the producer to the consumer. Now in the theoretical research on the mode of circulation, most scholars believe that the circulation mode is mainly to explore the reform and innovation of circulation organizations. At present in the circulation of agricultural products based on the problems, this paper proposes to establish a business of wholesale market and supermarket supply chain management mode of fresh agricultural products in the core enterprise, and explain the advantages of these two patterns, and puts forward relevant countermeasures and measures to guarantee the implementation of the two models; foreign scholars on the circulation of agricultural products were micro economics analysis using Structure-Conduct-Performance method. SCP is an attempt to evaluate the economic performance of the agricultural product market from the perspective of efficiency. The judgment material of efficiency evaluation is the market structure of agricultural products and the economic activities of the main body of circulation.

Agricultural products constitute one of the important pillars of the national industry, in its circulation process, both general circulation of goods, but also has its unique characteristics of circulation. Study on the existing agricultural products circulation mode and efficiency theory is mostly on macro level, mostly around the concept, circulation, necessity, feasibility and policy system of descriptive introduction, primary stage belongs to the theoretical research. At the same time, the theory of innovation and efficiency of agricultural products circulation mode and the continuous improvement theory need to be further expanded. Distribution channel is a set of interdependent organizations that make the products or services to be used or consumed smoothly, and can be called trade channels or distribution channels. The circulation channel refers to those with the production, distribution and consumption of all enterprises and individuals, a circulation channel includes all individuals and enterprises for the production and marketing process of some products, such as material suppliers, producers, middlemen, agents, retailers and consumers. Distribution channels of the length of the
structure, according to the level of the channel can be divided into zero level channels, one channel, two channels and three channels.

![Diagram of circulation channels](image)

**Figure 4. Circulation channels**

### 3.2. Online marketing of agricultural products

Big data makes the agricultural products marketing environment has undergone tremendous changes, consumers are no longer as in the past lack of information, timely access to information widely from various sources to make it more active and more fully understand the choice for agricultural products, more diversified and targeted. Marketing through big data technology can also be more comprehensive, low-cost acquisition of information, real-time analysis of the interests and preferences of consumers, and then to carry out precision marketing of agricultural products.

![Diagram of online marketing channels](image)

**Figure 5. Online marketing channels**

- **Consumers more personalized and proactive:** The era of big data, due to the rapid and wide dissemination of information, with convenient communication system, consumers become more innovative and initiative, consumer behavior has been a social media, chat tools, customer service reviews and influence circle of friends.

- **Marketing information, marketing tools more accurate:** Agricultural product marketing information has been in a relatively closed state, marketing tools are relatively backward. Under the environment of big data analysis data processing technology progress and the rapid development of electronic business platform, the marketing of agricultural products can quickly from the domestic and
international business platform, social media access to a large number of agricultural products purchase information, consumer web browsing records and feedback.

- **Marketing costs more affordable:** In the era of big data, because of the rapid development of network information technology and electronic commerce, social networking platform and trading platform continues to improve, marketers to obtain customer information is very convenient and cheap; at the same time, the rapid progress due to the large data analysis and processing technology, which significantly reduce the cost of customer attributes, behavior analysis, position, evaluation data.

- **The precision marketing model:** Big data technology has revolutionized the concept of change, technological change and the traditional mode of precision marketing, agricultural products can be combined with the regional characteristics of elements, product characteristics, customer characteristics, marketing situation and other factors, to provide more accurate and personalized service products, improve advertising precision, greatly reduce transaction costs and improve the efficiency of marketing at the same time, through the evaluation of consumers; data analysis and precision marketing model application results, can be based on consumer demand.

![Figure 6. Precision marketing](image)

4. **MIPRICAL ANALYSIS**

4.1. **Rice marketing channel**

This article from the input-output perspective using the DEA method to conduct a comprehensive evaluation of rice circulation performance so in index selection not only must comply with the Chongqing rice circulation channels, should also be in line with the characteristics of DEA. According to the classification of Philip Kotler on the commodity circulation channel mode, through field visits, research report and related documents, combined with the mastery of most data analysis, mainly divided into the following several kinds of rice circulation channels:

1) **Producer-Consumer:** This mode is called direct channel. It refers to the agricultural producers to sell agricultural products directly to consumers, is the most direct, the most simple and the shortest distribution channels. But on the one hand because the wide than living in remote areas, traffic inconvenience, lack of traffic and transportation; on the other hand, because the majority of consumers to buy less, so many producers will not sell their products to consumers.

2) **Producer-retailer-Consumer:** This model refers to the agricultural producers to sell agricultural products to retailers, and then sold by the retailer to sell the final part of a retail chain. Such as: rice listing season, many rice farmers will be rice to the town to the wholesale price of the sale to them.

3) **Producer-wholesalers-retailers-consumers:** This model is used for the majority of medium and small enterprises and retailers. Agricultural producers of agricultural products to the wholesale (with several wholesale), the wholesale sold to retailers, sold to the final consumer. Through this channel flow. Agricultural products from wholesale enterprises to buy, and then transferred to the local wholesale enterprises to do the two wholesale.

4) **Producer-buyers-wholesalers-retailers-consumers:** This model is in between the producers and
wholesalers after a link between the acquisition of the link. One is the establishment of the grassroots business sector independent accounting of the acquisition of the acquisition and supply and marketing cooperatives. They bought and then handed over to the city and County commercial wholesale enterprises. One is individual traders. They go down the street in a series of towns, and then sell them to the wholesale business. At present, in the vast rural China many scattered small farmers due to constraints, most of them choose the production of agricultural products sold to street vendors.

5) **Producer - manufacturer - distributor – retailer:** This model is the producer of agricultural products sold to the processors, rather than the acquisition of business. This model of the original form of agricultural products is not suitable for direct consumption of consumers, must be processed products. The main link in the process of processing agricultural products circulation.

4.2. **DEA model**

When we evaluate the performance of the rice circulation channels, the circulation channel is to treat as an integrated whole organization, to evaluate the circulation channel performance from the two angles of resources and output results. Essentially, the compression time and reduce the cost of all from the perspective of resources on the distribution channels in order to reduce the waste of resources, so as to improve the rate and the circulation efficiency of resource utilization, in order to improve the overall profit margins to create circulation channels. On the one hand, because of its regional and seasonal characteristics, the time consumed in the process of rice production has become a consideration of the formation of competitive advantage. On the other hand, based on the modern information age and the era of logistics, time based competition has become a mainstream competition mode of modern logistics industry. How to make the distribution channels more compact, more efficient, and to achieve the best state that is the highest goal of the modern logistics industry is the highest goal. Human resource is a very important resource for the operation of rice distribution channels, and the circulation technology needs the talent with a certain level of knowledge. To sum up, this paper will cost, time and human resources as input - output type rice distribution channel performance evaluation system from the point of view of the main aspects of investment. Increasing the flexibility of the circulation channels, optimizing the financial situation and improving the service level can be regarded as the final effect of the operation of the rice circulation channel, and it can be used as the evaluation factor of the output.

| Table 1. Rice distribution channel performance evaluation index |
|------------------------|-----------------|-----------------|
| **Input index**        | **Output index** |
| **Cost**               | **Logistics cost, transaction cost** |
| **Time**               | **Circulation time, service time** |
| **Human resources**    | **Personnel training, management efficiency** |
| **Flexibility**        | **Flexible product, flexible inventory** |
| **Financial situation**| **Sales, net profit** |
| **Service level**      | **Customer satisfaction** |

This paper selects the traditional circulation channel mode on behalf of the enterprise are respectively DMU1, DMU2, the Internet channel representative rice circulation enterprises DMU3, DMU4. according to the definition of the evaluation index system of input-output type rice circulation performance of input and output indicators of circulation channel data collection.

| Table 2. Input and output data of rice circulation enterprises |
|------------------------|-----------------|-----------------|-----------------|-----------------|
| **Input index**        | **Cost** | **DMU1** | **DMU2** | **DMU3** | **DMU4** |
| **Time**               | 18      | 12      | 7       | 5       |          |
| **Human resources**    | 421     | 842     | 356     | 402     |          |
| **Flexibility**        | 0.2     | 0.1     | 0.2     | 0.3     |          |
| **Financial situation**| 407     | 586     | 185     | 243     |          |
| **Service level**      | 62      | 75      | 90      | 91      |          |

According to the revised data into the integrated DEA preference cone model, using Lindo6.0 software, you can get the DMU evaluation of the overall effectiveness of the unit, the effectiveness of the technology and scale efficiency. From the results, we can analyze the comprehensive performance of the circulation enterprises in two kinds of rice distribution channels. The overall performance of the traditional circulation circulation channel
mode is lower than the circulation channel model innovation mode, circulation model of agricultural products is mainly to review the whole circulation performance, the overall performance of the majority of the electricity supplier platform can achieve the optimal.

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<th>Table 3. Rice circulation performance analysis</th>
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This shows that in the field of traditional agricultural products circulation, the overall performance is not high is still hindering the development of circulation industry and the important reasons for the development of grain industry. And the main reasons that affect the circulation time, the transaction cost, the circulation cost, the customer satisfaction and the output flexibility are the circulation means, the organization degree and the information. The content of science and technology innovation and improve the means of circulation can largely solve the circulation time delay problem in Germany, there is a large area of the pipeline transportation circulation mode, pipeline transportation mode is not affected by artificial, traffic and climate, can consume time and reduce the yield loss during transportation maximum circulation in. The degree of organization and information technology also determine customer satisfaction and yield flexibility. It can be said that the degree of organization and information technology are inseparable, only a high level of information to be able to allocate a high level of organization, the organization’s response capacity is limited by the information technology. In the rural areas of China, there is still a lot of agricultural enterprises in the information and the regional dual closed environment, information on the perception of the outside is not sensitive enough, no computer information receiving processing system, no newspaper media broadcast market, thus impeding the flow of the overall performance improvement.

5. CONCLUSION

The research results show that the channel model of Internet platform model in circulation mode is better than the performance of traditional, but the traditional rice circulation channels still has its existence rationality and the continued development of the space, we from the government’s point of view on how to develop the new rice circulation channel model and how to further improve and integrate the traditional rice circulation channels this thesis puts forward some policy suggestions. To promote the traditional distribution channels of agricultural products to the scale of the development of the direction of the organization must be established, this is an important measure to improve the performance of traditional channels of distribution channels. At present, in the traditional rice channel mode, the scale performance is low, so the government should strongly support the development of the traditional circulation enterprises in the direction of large-scale. The government should actively guide enterprises to expand the scope of business, increase the output of enterprises, improve the operational capacity, etc.. Improve the agricultural products of the traditional channels of information and technology. Only a high degree of transparency of information technology and transport technology to ensure the efficiency of the traditional distribution channels to complete the order. The traditional distribution channels in the organization will be able to get a very good development, we must rely on Information Science and technology advanced and modern logistics means to its scale and organization development, so as to improve the technical performance of distribution channels.

REFERENCES


