Business marketing analysis of agricultural products on online platforms based on big data

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Abstract. In recent years, online platform shopping has gradually become a mainstream shopping method for the public. And with the continuous development of China's poverty alleviation cause in rural areas, marketing of agricultural products has al-so been added to online marketing, but in the process of development, various unsuitable situations have emerged, and data cannot be combined with products, resulting in the further development of agricultural products in this marketing mode has been restricted. Nowadays has entered the big data era and the market-ing of big data has appeared in many industries. This paper, through a systematic review of domestic and foreign literature, uncovers a basic framework of big data for agricultural products in online platform marketing, explaining the basic defini-tion and characteristics of big data, and elaborating the application. Although there is logistic regression model to truly realize big data in agricultural products online platform. The application of big data in agricultural products online plat-form marketing is explained.

1. Introduction

China is a large agricultural country, the development of agricultural economy being the lifeline of national economic development. China is moving towards the era of information technology and big data, the background of the Internet with big data as the basic feature, relying on the integration of the world economy and the liberaliza-tion of agricultural products trade development of personalized marketing of agri-cultural products, has become the trend. Agricultural information construction can not be delayed. In 2015, Premier Li Keqiang put forward the concept of "Internet+" at the meeting, advocating the deep combination of the Internet and traditional in-dustries to create a new development ecology, achieve the Chinese dream of innova-tion and common prosperity for all. In order to fulfill the monitoring and traceability of agricultural production process which means that agricultural products company can fully regulate the whole production process, such as fertilizer use and staffing, etc., timely remote regulation to ensure the safety of agricultural products, enhance the motivation of producers, and achieve assembly-line efficiency, the evaluation of agricultural production results, improve the efficiency of agricultural sales, helping farmers to enrich themselves, and promoting the digital upgrading of agriculture, have become a powerful driving force for the rapid development of China's agricul-tural economy. [1]

2. The role of big data in agricultural products online marketing

2.1 Stabilize the rapid development of agricultural products market

The traditional sales of agricultural products in China are mainly based on scattered small farmers and the inputs to land are relatively small, the proportion of labor in inputs is larger, and inputs of production materials and the application of modern agricultural technology do not play a major role [2]. The main factors affecting the growth of agricultural output are the size of the land area and the natural fertility of the soil. It is also called rough agriculture, in an attempt to plant a wide range of thin profits, which is very purposeless. Then the traditional sales of agricultural products are mostly cooperation between farmers and wholesalers. In such an era of diversi-fied and individualized consumer demand, it has been unable to meet the develop-ment needs of the market, with a large backlog of agricultural products, the inability to accurately locate the consumer population, declining prices and declining profits of agricultural growers. The emergence of big data provides a new opportunity and sci-entific basis for all this [3]. Farmers can be more clear about the demand information of the agricultural market, directly sell their agricultural products as merchants, such as live webcasting, and can also focus on selling to large-scale e-commerce enterpris-es or intermediate brokers, just as Professor Yuan Guojin proposed in Atlantic Press the information asymmetry theory. The theory of

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information asymmetry [4], namely information asymmetry between supply and demand of agricultural prod-ucts. Farmers don't know consumers' preferences, and consumers don't know the fluctuation of prices of agricultural products, etc. Combined with the special agricul-tural industries in some poor counties in China, he believes that agricultural products marketing should cooperate with big platforms like WeChat and qq, using software such as SPSS to make data statistics, to shoot and upload the production process of agricultural products, and rate farmers' products according to the information re-turned by users [5]. It is convenient for users to select products according to the evaluation level. The main functional modules of the platform page include user login, registration, shopping, service, real-time news, personal center, etc., to realize a series of operations such as user login, browsing, searching and payment, so as to increase the transparency of brand information, reduce the selection cost of buyers and increase the sales quantity of sellers, which is not limited by time and space. At the same time, Professor Xiang Chaoyang of Huazhong Agricultural University pro-posed that the farmers who are producers can hardly become the main body of agri-cultural products marketing, because the individuals are too scattered and the pro-duction scale is narrow. They can act as the intermediary institution between farmers and consumers through agricultural brokers and leading agricultural enterprises to complete the marketing. For the agricultural products marketing just started, it can take the network without site marketing, and after the strength grows gradually, the marketing theme can establish the propaganda type website [6]. Farmers will create personalized programs to plant agricultural products which can achieve the highest economic returns in different seasons, concentrating all human and material re-sources to meet the diversified and personalized consumption needs of consumers, reduce as much as possible the so-called inventory waste, the problem of rotten and wasteful agricultural products. It will maintain the rapid development of the agricul-tural products market.[7][8]

2.2 Open up personalized and precise agriculture

The traditional agricultural production method presents a crude development mode, which has a gap with the emerging marketing mode of personalized and precise posi-tioning that is popular nowadays. And the network platform marketing using big data can show excellent performance in supply and marketing of agricultural products. As Chen Yiqing, Yang Fenli said there are problems of marketing positioning and ex-ploring the market in the traditional mode. It is mentioned that data related to ki-wifruit e-commerce marketing can be collected through the Internet and other means. And based on these data, a database of kiwifruit geographic information is estab-lished, which is then intelligently analyzed and deeply mined based on technologies such as GIS (geographic information system) to achieve detailed statistics and analy-sis of marketing data. In fact, the network platform uses big data technology to ana-lyze the user's clicks, browsing records, consumption preferences and other infor-mation to make an intelligent portrait of consumers and derive their preferences. Then it can then be based on the existing data of different amounts of products in the different areas to allocate them. It can provide farmers with the scientific evi-dence of producing and the demand information of agricultural products market to help them shift the type of products in time. This not only meets the diversified and personalized needs of consumers, but also promotes the change of agricultural pro-duction structure from single to diversified system and the reform of agricultural sup-ply-side structure. It finally realizes the special features of agricultural products and creates maximum profit.[9][10]

2.3 Promote the combination of agricultural products logistics and network platform

In addition to quality and price, transportation is a crucial part of a good agricultural product, especially for seasonal agricultural products with short shelf life or freshness requirements. Logistics time is the guarantee of successful marketing of agricultural products. The establishment and perfection of the logistics system will have a great impact on the sales of agricultural products enterprises network marketing. Big data technology can promote the synergistic development of agricultural products logistics and network platform. Big data technology can build a big data platform shared by agricultural products producers, agricultural products network platform and logistics companies, in which the information of agricultural products from the beginning of planting, results, picking to transportation, delivery and signing is shared completely. This not only improves the transparency and safety of agricultural products during transportation, but also consumers can easily know the origin and production process of agricultural products at the time of shopping, increasing consumers' trust in the online marketing platform for agricultural products. Once the marketing of agricul-tural products forms a large scale, this kind of logistics combination can greatly re-duce the cost, because big data technology can analyze the demand of different provinces and cities, making reasonable quotas, carrying out the most planning of routes, reducing the transition costs of inventory centers and distribution centers in the past, and sending directly from the origin to local distribution stations to improve logistics efficiency and reduce costs. [4]

3. Suggestions about big data for agricultural products in online platform business marketing

3.1 Create distinctive brands of agricultural products

China is a vast country with a large number and variety of agricultural products, which seems to be an opportunity to meet the diversified needs of modern consumer. But at the

same time, it is also a challenge for online marketing of agricultural prod-ucts, because any product must reach a certain scale of sales before it can be recog-nized and sought after by consumers in the market, which is also called the brand effect. When there are more and more homogeneous products, the competition be-tween enterprises will become more and more fierce. There is a law in management called Law of the Mind. If a product can enter the customer's heart first, it is more important than entering the market first, creating the concept of the original, to gain long-term advantages, such as the new Oriental selection, the first to bring agricultural marketing into the new era of webcasting. Although there are now many imitators, imitators can not reach the level of it and none of them can reach its three-month GMV of 2 billion feat. And these achievements are largely attributed to its creation of the brand deep in the hearts of people.

Big data technology can help agricultural products online marketing platform for branding construction. First of all, to achieve accurate personalized marketing and publicity of agricultural products, and constantly expand the visibility of the brand of agricultural products, so that more consumers know the characteristics of the brand of agricultural products, constantly according to big data analysis, real-time attention to consumer preferences, adjusting brand positioning, quickly creating the brand im-age of agricultural products, improving the marketing of agricultural products in the online platform market competitiveness of agricultural products.

3.2 Logistic regression model introduced into agricultural products online platform marketing

Logistic regression model is based on log(p)=logp/1-p, and then evolved into log(p)=W_0X_0+W_1X_1+.....WX+b, Finally, this equation is inverted to get a sigmoid function.

$$y_i = \frac{1}{1 + e^{-w^T x_i - b}}$$

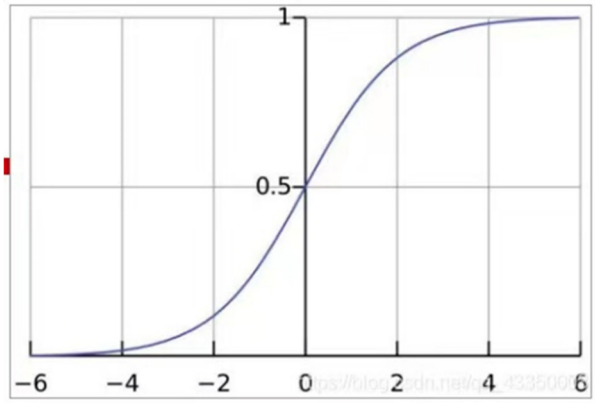

Fig. 1. Sigmoid function graph(self-drawing)

When X is 0, the function value is 0.5, as x increases, the value of the function will approach 1, vice versa, and finally a threshold value is specified, which is greater than the threshold value and is judged to be 1, and vice versa is 0. In the marketing of agricultural products online platform, I make the data collection of five dimen-sions of agricultural products varieties, regions, annual waste of different agricultural products, web browsing volume, and repurchase rate, which are called x_1, x_2, x_3, x_4, x_5. Then I will determine a specific amount of successful sales of agricultural prod-ucts according to the literature and data I have browsed, called y. Then I will divide the collected data into training data and test data, and establish a logistic regression model, with successful sales represented by 1 and unsuccessful sales represented by 0. The training data will be replaced by the training data, and the parameters w, b will be calculated by the maximum likelihood method or Newton's method to get the fi-nal accurate formula:

$$y_i = \frac{1}{1 + e^{-w^T x_i - b}}$$

Then substitute into the test data to check the data fit, perform the result calcula-tion, and finally pinpoint the consumer's preference.

The logistic regression model can combine and evaluate the multi-dimensional in-dicators of agricultural products, which is more comprehensive and reliable. Finally, the algorithm is used to obtain the probability of successful sales of different agricul-tural products with high calibration rate, which helps growers determine the different demands of different markets for agricultural products, precise positioning, reduce costs and improve sales in logistics.

3.3 Improving consumer trust in online marketing platforms

Robert J. Kauffinan believes that the trust of buyers to sellers is important in online marketing, and the high trust of buyers to sellers can increase the chances of buying from hotspots on online platforms. It can be found that whether it is Taobao, Jindo, or other e-commerce platforms, there are merchants that customers do not trust and merchants that are extremely popular with customers. Therefore, we can use cus-tomer feedback data to establish a "red and black list system". And the "red list" re-fers to merchants that have received 20% to 60% of customer likes or have a repur-chase rate of more than 50%. These merchants will be pushed by big data to more consumer pages to increase their exposure. The "blacklist" is the merchants who have received more than 60% of complaints, and the list of merchants continue to reduce the exposure rate. If the list continues for two months, they will be removed from the online platform marketing qualifications, and the list should be shared between the platforms, so as to strengthen the control of the quality of products and the trust of customers to the platform.

4. Conclusion

People's food is the sky, and agricultural products are the necessities of people's life. Our country has abundant types and amount of the agricultural products, which provides a superior innate condition for agricultural products in network platform marketing. With the continuous improvement of consumers' living standard, con-sumers' demand for diversified and personalized agricultural products is increasing, and the demand for their added value is also gradually increasing. With the

support of big data technology, China can build a more perfect and efficient online platform marketing mode, and truly respond to the government's call for poverty alleviation to combine different rural characteristics, like farmers, agricultural products and con-sumers organically, analyze various modern data comprehensively, realize precise and personalized marketing of agricultural products, and promote sustainable agri-cultural development.

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