



An Exploration of the Market Opportunity for a Produce E-Commerce Platform in China

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Abstract

This paper focuses on identifying problems in consumers' selection and purchase of fruit by way of online channels, while proposing a solution aimed at overcoming those challenges. Specifically we identify important buyer preferences related to the taste, origin and other characteristics of fruit, which at present are overlooked by many e-commerce platforms. Additionally, we identify particular deficiencies in this market, servicing businesses like high-end catering and restaurant buyers. We test our assumptions about this market by way of a survey as well as interviews with potential buyers. Our findings confirm the pronounced challenges faced by high-end catering and restaurant businesses in ensuring the quality and integrity of their fruit-related supply chains. In response to these businesses' concerns, we have designed an e-commerce platform, which classifies fruit according to the characteristics such as taste, origin, sweetness, crispness, and size. Consumers can see the sweetness and crispness ranking of different types of fruits, and easily choose their favorite fruit. We also explore the use of novel blockchain technologies to address the uncertainty of online fruit purchases, overcoming trust issues by requiring farmers and shipping companies to update information on each shipment on their servers daily.

Keywords: fruit e-commerce; B2B; B2C; customer base; block chain

1. Introduction

Recent studies have suggested that agricultural e-commerce may be one of the last remaining unexplored e-commerce markets in China [1]. Fruit e-commerce has risen in tandem with growth in online shopping platforms. Merchants presently can sell their fruits by putting them in their online stores or stocking them nationwide and selling them on the platform. Many famous online platforms like Taobao, Jingdong, Hema, have begun to sell fruit. However, despite the popularity of online shopping, many problems remain in the selection and purchase of fruit by way of these platforms. Most Chinese scholars believe that current fruit-related e-commerce is still in its infancy [2]. Specifically, concerns have been raised about the technology and management methods, which are seen as lacking unified management and supervision [3].

As a result, some customers do not feel satisfied with

the quality of the goods they receive. On the one hand, the taste of some fruits can change during transportation, leading consumers to believe that the merchants are cheating them with bad fruit. On the other hand, many consumers lack understanding regarding how the taste of the same kind of fruit may differ from region to region.

Although these issues may appear small, they are significant enough to cause consumers to avoid future online fruit purchases. Our company's new fruit platform seeks to solve these problems by making the operation interface more convenient and using blockchain technology to make consumers trust the authenticity of products.

2. Literature Review

2.1. The development and current condition of online fruit market

Although the development prospects of online

shopping platforms are promising, there are still some shortcomings that need to be improved. "I feel the biggest disadvantage of online shopping is we do not physically see the item till it arrives.[4]". If you can't see the item in person before placing the order, people are likely to misunderstand, often the item in the picture is better, which may result in the item not meeting people's expectations. For fruits, this disadvantage is serious. Over time, fruits will naturally oxidize and gradually deteriorate. Most of the time, people have requirements for the freshness of fruits. For the quality of fruits that cannot be seen with their own eyes, It is very likely that when people receive the fruit, it does not match what they see in the picture. "Only a few sites offer free shipping, some others will ship for free only if your total purchase price exceeds a certain amount.[5]". Usually after people complete the payment for the order, the shopping platform will package the item and start the delivery, and the cost incurred during the transportation process needs to be paid by the customer, and the free shipping over a certain amount is already included in the shipping fee.

For customers, they do not expect extra shipping after completing the order, which is obviously not included in the cost of the item. After the customer has consumed the favorite fruit, it is obviously a disgusting setting to charge the shipping fee. If there is a slightly higher requirement for the fruit sold, the customer may consume products in remote areas, and the shipping fee incurred during this period will also rise. Excessive shipping costs can even exceed the price of the fruit itself, which will also make consumers unwilling to buy.

As shown in figure 1, the size of fruit retail market shows an overall increase from less than 900 billion in 2016 to about 1200 billion in 2020. Most importantly, with the rapid development of consumption upgrading and online consumption, the size of online fruit retail market is continuing to grow and percentage of online market also shows an overall increase. This means that people's demand for fruits continues to rise and the online fruit market is developing rapidly.

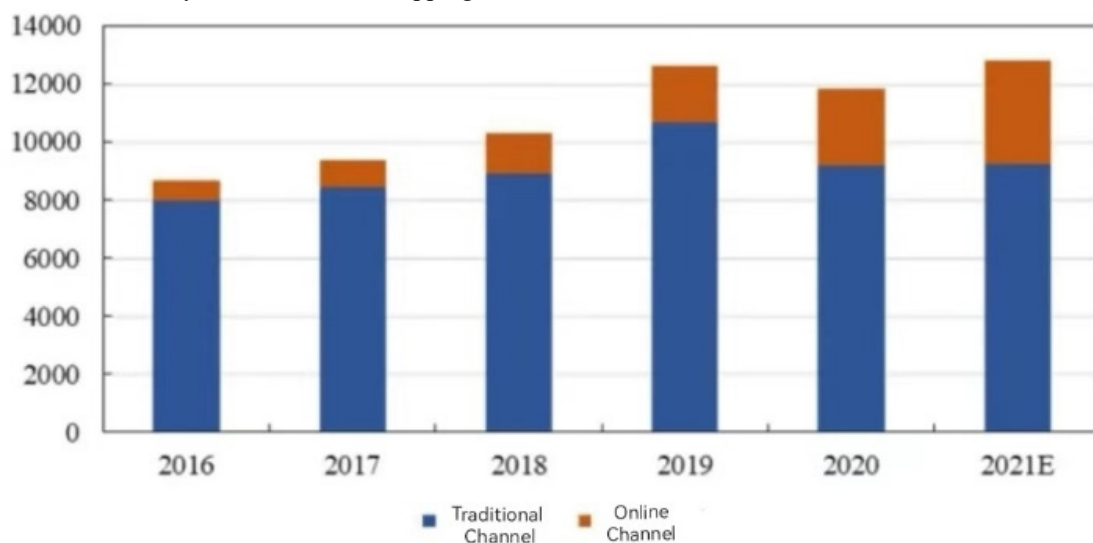


Figure 1. Size of fruit market in 2016-2021 (Data source: Open source. Figure source: Cnagri Database) Size of Fruit Retail Market in 2016-2021 (unit: 100 million Yuan) [3]

2.2. B2B model in fruit e-commerce

According to the definition of B2B model in journal of Business Economics Research, B2B(business-to-business) integrates financial and logistics industries and provides merchants with transaction information and services through a virtual but disembodied trading platform. Currently, there are some B2B e-commerce platforms exist and large platforms like Taobao also involve B2B model in their business.

In most researches, 'fruit e-commerce' is classified in 'fresh e-commerce'. Among all the literatures I read, the prior investigations on fresh e-commerce mainly focuses on B2C model, like 'Construction of B2C supply chain model' and 'Factors influencing consumer satisfaction', while less researches were launched to study B2B model

in this region. What's more, we could hardly find one that focuses on fruit e-commerce.

Although there are few researches on fruit e-commerce, we still find some researches on B2B food e-commerce and agricultural e-commerce. The one that is most similar to our study is a product commercial design research based on a fresh food e-commerce project of Meituan. Researcher Jiaying Chen conducted a comprehensive analysis of the fresh food e-commerce project in the way of business model canvas, in order to clarify the problems existing in the existing model and redesign it, and supposed the viewpoint of empowering B-end merchants [6].

Research on the food B to B platform and the purchasing end of catering industry. Most of the previous scholars said that it has a bright future, but they also

raised a lot of problems, such as ‘extremely dispersed production and processing end of food materials, poor standardization, lack of safety inspection, difficult quality control and traceability (China Food, 2019)’ but very few studies have proposed solutions. Furthermore, most studies have mentioned the importance of supply chain in B2B in food e-commerce, such as direct collection of origin, classification and temperature zone database, etc.

In terms of market opportunity for our B2B platform which forms direct contact with catering businesses, ‘at present, the main channel for catering enterprises to purchase agricultural products is still farmers’ market, which still accounts for as much as 78% of sales,’ revealed that online agricultural platform still has a long way to go to compete with offline markets.

Above all, there is a lack of prior research in the field of fruit e-commerce so our research will fill in the gaps. In our research, we will learn from previous research methods like case analysis and business model canvas. Furthermore, many studies have noted the importance of supply chain in an e-commerce platform, so we will find ways to improve and build a supply chain to solve the problems. Once a more advanced supply chain is launched, both consumers and producers in an e-commerce business will benefit from the supply chain.

2.3. B2C model in fruit e-commerce

According to the definition of B2C model in the Market Business News, B2C, which stands for business-to-consumer. It refers to a platform that sells a products or services directly to individual consumers. With the rapid development of e-commerce at present, China’s mainstream e-commerce platforms are becoming more capable. Therefore, B2C e-commerce can better serve users from the aspects of platform quality control and logistics distribution like JD.com.

Based on my research, the total size of B2C e-commerce market value in 2021 is 4.01 trillion dollars. It is expected to expand at a compound annual growth rate (CAGR) of 9.7% from 2021 to 2028. However in the huge B2C e-commerce market, most of them are comprehensive e-commerce platforms only few focus on ‘fresh e-commerce’ and the proportion of fruit e-commerce is even less.

As a results, our platform can mainly focus on fruit trading by using B2C model which can better reach customers and understand the needs of target customer groups. Also through online platforms, users’ online consumption behaviors can be recorded, and then the consumption characteristics of users can be analyzed. After understanding the characteristics of users, and then according to the consumption habits of different users to do targeted promotion.

3. Methodology

Considering whether to apply model B2C or B2B in our e-commerce platform, we conducted two sets of primary research to collect ideas from individual customers and businesses.

3.1. Survey Questionnaire

In order to access the market for a B2C fruit e-commerce platform, we designed a survey questionnaire which targeted at individual customers and their experience and ideas of online fruit shopping. The aim of launching the survey was to confirm our hypothesis ‘the majority of people have difficulties in finding the right fruit’, and to know what is the biggest concern of people when buying fruits online and what is the problem people have about their daily fruit. Most importantly, we wanted to do a customer segmentation based on the results of the questionnaires to see which group of people (housewives, workers or students) are our main customer so we could design our platform according to their needs.

Our online questionnaire was designed on ‘SO JUMP’ and spread through WeChat, with a sample base of 260 containing people of different occupations and age groups. When doing data analysis, we chose ‘occupation’ as a variable and control other factors to see which group of people met the problem of unsatisfactory fruit most often and which group regard this as a significant issue. Then, those who met the conditions turned out to be our main customers and we read their answers to ‘the reason of buying fruit’, ‘biggest concern on fruits’, ‘reason for unsatisfactory fruits’ and ‘suggestions on online fruit shops’ more carefully to find out their needs and offer them a solution that is better than the existing ones.

3.2. Interview

To know more about the market for B2B fruit e-commerce platforms and see whether enterprises in the high-end catering industry need our services, we contacted 12 people that are in charge of relatively high-end catering enterprises involving snack bars, hotels and restaurants and had a brief online interview with them on WeChat.

The interview was aimed to know how important a reliable source of fruit is for them, whether they have problems with their sources of fruit and what is their biggest need for fruit, so we will be able to provide them with a solution. We noted down their answers and determined whether these enterprises can become our potential customers from the importance of reliable fruit supply. We also asked them for their expectations on a better source of fruit supply as some ideas for designing our profile.

The limitation of the interviews is that the businesses we contacted may not be high-end enough so we didn’t

know if those really high-grade restaurants with even higher requirements for ingredients will have potential demand for our platform. Also, we only interviewed 12 restaurant managers so their views may not be representative of most restaurants.

4.Results

4.1. Result of Interviews targeted at Catering Enterprises

Among all the interviewees, we chose two most representative ones to analyze their answers in details.

Operator of a restaurant said that being able to offer customers nice fruit is not his most important objective, but it's indispensable and a reliable fruit supply is very important for him that he will take it seriously. Nowadays, he has his own fruit supplier while he once experienced fruit loss caused by logistics delay, but that's not a big problem so he won't change his fruit supplier because of that.

Director of food and Beverage at the hotel share similar opinion on the importance of fruit with the restaurant operator. He mentioned that the problem he met was that the quality of fruit is not guaranteed and sometimes the taste is poor, he think he will change his fruit supply if that problem happens again.

From these two answers we learnt that the importance of fruit supply is quite high for them, and they both have problems with their current fruit supply.

Generally speaking, all respondents think that a reliable fruit supply is important for them and they will choose that carefully, 80% of them have their own fruit suppliers so they don't buy fruits together with other ingredients, while most of them have problems with their current fruit supplier and expressed their point of view of willing to change another supplier.

When asking about their biggest concern on fruit, all of them answered 'freshness' and 60% of them also mentioned the taste of the fruit. Their problems with current fruit supply are mainly about the uncertainties of the freshness, taste, origin and logistics of the fruit.

4.2. Results of Questionnaires targeted at Individual Consumers

Among all the interviewees, we chose two most representative customer groups to analyze their answers in details.

Housewives:

'More depends on family tastes. Nutritional value is greater than edible value'

'Mark place of origin is incorrect, very attention on whether the fruit come from place of origin. Long

distance transportation will lead to different maturity'

Students:

'I suggest fruit is sorted by price because it makes it easier for customers to find fruit at the right price'

'I prefer dividing the fruit by price, so that I can save money to buy delicious fruit, while the price can indirectly lead to the range of imported goods'

'According to my personal consumption view, the more expensive the better. Therefore, according to the price classification, different people can be provided with the different products and personalized services'

According to the survey with housewives, we found that 80% of housewives buy fruit online several times a week (as shown in Fig.1) but almost all of them were dissatisfied with the fruit and the personal interviews revealed that the main problem that housewife focus on is the origin of the fruits. They firmly believe that the fruits quality are mostly determine by their origin. Thus, our platform can use block chain to clearly and specifically document where the fruit was grown and shipped or even ask farmers to record what they use when growing fruits.

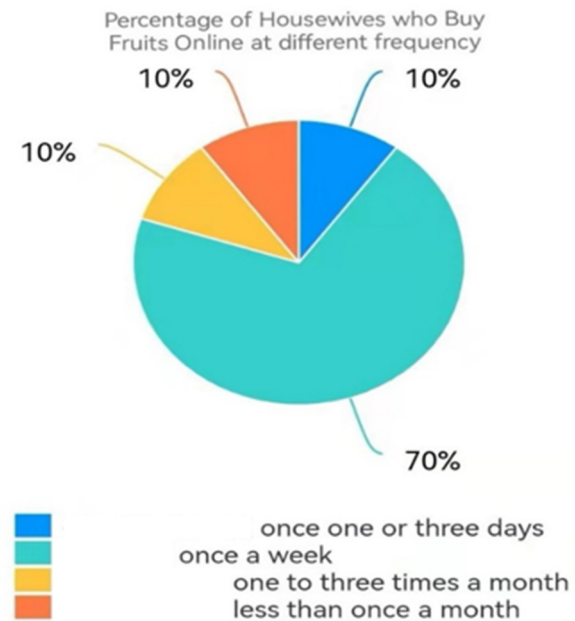


Figure 2. Percentage of Housewives who Buy Fruits at certain frequencies.

As for the students, 40% of them buy fruit online several times a week (as shown in Fig.2) and they mainly consider about the price. Therefore our platform need to lower the cost in the supply chain to reduce the price when welling and satisfy those students expectation and maximize our profit in the end.

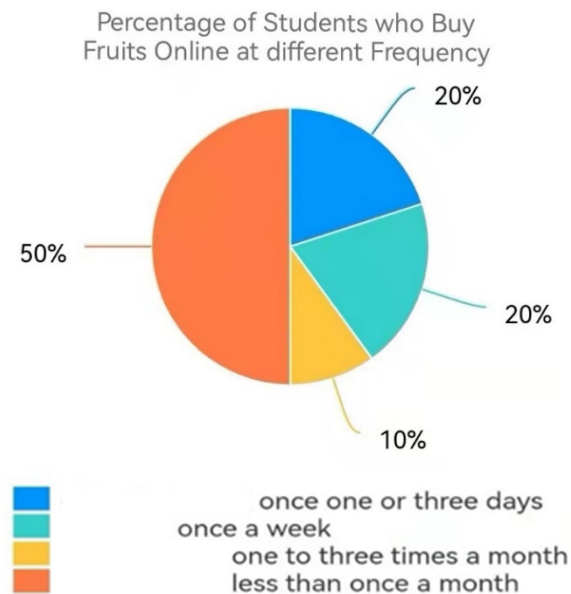


Figure 3. Percentage of Students who Buy Fruits at certain frequencies.

5. Discussion

5.1. B2B VS B2C

As for B2C model e-commerce, with the development of technology, the security of online payment is improved and the logistics distribution system is gradually complete so that B2C e-commerce market has a trend of saturation. For instance, JD.com already found that using third-party logistics cannot make sure the delivery speed, distribution mode...Therefore the JD.com establish its own logistic which focusing on intelligent logistics and gained the favor of most customers. Furthermore, using B2C e-commerce is hard to avoid lack of customer experience with the product. Therefore, when customers receive unsatisfied goods, they will ask to return them but as fruit e-commerce our platform cannot achieve sales return due to the quality and ripeness of the fruit will be

affected.

In terms of B2B model, according to the previous researches, there are much less prior studies on B2B fruit e-commerce than B2C ones, also, a B2B fruit supplier is not that common among restaurants while B2C platforms have already been quite popular among individual consumers. What's more, there are several large B2C platforms that provides customers with fresh food including fruits, these bid platforms have high customer loyalty which makes a new small platform hard to compete with them. In contrast, through the conversations with high-end restaurant operators, they seemed to have larger problems with their current fruit supply and care more about the quality of fruit than individual consumers, and 90% of them have the idea of changing their fruit supply, which means they are more likely to be our potential consumers.

Comparing to the model B2C, more researches is needed in B2B fruit e-commerce since very few studies were launched in this field. In addition, there are more opportunities and less competition in the market for B2B online fruit suppliers. Therefore, we choose B2B as the original model of our platform and we will consider whether to add B2C model after we went into 'growth' stage.

5.2. Our Value Proposition – according to results of survey

Responding to the concerns of B-end consumers, we designed a classification system to show the clear information about a fruit's taste, origins and some other characteristics including sweetness, crispness and size. Consumers can see the ranking of the sweetness and crispness of different types of fruit so they can choose their favorite ones easily. Concerning about the freshness of the fruit, we automatically recommend the nearest merchant to our customers to ensure faster delivery.



Figure 4. Our further road map to finish the design of our platform

In terms of how to do the classification and ranking, we first ask experts to comment on the fruits and form a basic classification and ranking system, and gradually improve it according to consumers' feedbacks after our platform launched. The graph below shows our ways to form our final platform.

5.3. How could blockchain help improve our platform – solving the problem of uncertainties of online fruit purchases

Blockchain technology is still in an early stage. It is powered by a server on which users can share information, specify business contracts, etc. Because of its encryption and decentralization of information, the information in blockchain has high credibility and many practical fields. It has been widely used in finance, medical care, payment and settlement, social networking, gaming, real estate, the Internet of Things, agriculture, entertainment, and other industries. However, the information reliability of the products is always a severe problem in fruit e-commerce. Many start-ups go bankrupt because of a lack of solid supply of goods and sufficient user trust.

With the support of national policies for agricultural e-commerce, blockchain technology is gradually coming to the forefront. Blockchain technology can be perfectly combined with the supply chain members to solve the trust issue. In terms of the supply chain, e-commerce has a natural disadvantage compared with traditional

merchants in cargo transportation and freshness due to high packaging cost, small transaction volume and scattered connections between merchants, and the high transportation cost of insurance products like fruit. The combination of blockchain and logistics can make the platform and logistics company's requirements more quickly communicated; At the same time, when logistics companies connect with farmers, thanks to the powerful computing capacity and data transmission rate of the server, even when they connect orders with many farmers, they can also efficiently complete the connection. In terms of product packaging, with the help of blockchain, for some immediate orders, the platform can prepare the goods for delivery within one to two days after receiving the order. After a user places an order, the blockchain can collect this information and share information about orders near logistics companies and farmers. This allows them to deliver goods without too much communication with the platform. At the same time, such a timely delivery mode can significantly reduce the platform's demand for fruit preservation equipment, thus reducing the cost of preservation.

The platform can solve the trust problem by requiring farmers and trucking companies to update the information of each shipment on their servers daily. When consumers shop on the platform, they can see the real-time updated information about this batch of fruits provided by farmers, freight companies, and the platform in the information introduction of this product. In this way, users can be assured to buy goods. Employees

already in the supply chain perform the information recording process, so there is no additional cost to the platform to use this method.

The insurance of the supply contract signed by the platform and local farmers is also a big problem. When the price of goods rises sharply, or the demand increases sharply, this is bad situation. Farmers usually choose to breach the contract when the penalty is not high to gain higher interest, undoubtedly a loss to the platform. However, blockchain can create real-time contracts, which can adjust the transaction value according to the market and various aspects of current information to create the maximum benefit for both farmers and platforms.

6. Conclusion

Our study is aimed at building a new type of fruit e-commerce platform and design it according to current market opportunities. Through our primary and secondary researches, our platform turned out to be a B2B e-commerce platform with the help of block chain and the service of providing clear information and classification for all fruits.

Since few prior researchers studied B2B fruit e-commerce, our study helped to cover the shortcomings of previous researches. Also, as the technology developed, blockchain has been used in various regions but few in agriculture. Thus, this paper can fill the blank of the application of blockchain.

The model of our platform can help in improving the efficiency of the interaction between farmers or fruit merchants by trying to reduce the information failure of the B-end consumers, and with the help of blockchain, the efficiency of trading and quality of crops will be greatly booted and supervised.

However, our study does have some limitations. The researcher use survey and interviews as our research method but the sample size is too small so that the result may covers only a subset of people's thoughts. And case study is also a lack in our study because most of the platforms are synthesizing type, we did not find any B2B e-commerce platforms that only focus on selling fruits. Since we don't have a successful case to support, the actual practicability of our platform remains to be seen.

In the future, small and medium size companies can cooperate with each other by sharing the information of goods in blockchain. Since it can solve the trust problem so that companies can reduce the cost of building the distribution channels. In addition, better cold-chain in delivery system is well worth investigating as the freshness of fruits is the largest concern of those B-end consumers who run high-end catering businesses, so a more advanced cold-chain could promote the cooperation between fruit farmers, e-commerce platforms and catering enterprises.

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Hongrui Song and Jingliang Wei are second authors.

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