An Analyze of Chinese Online Fresh Food Industry

Qilong Zou

Abstract—**Fresh food is an essential need for all human beings. Through the mobile internet, online shopping has become more and more popular, leading to more consumers buying fresh food online. The markets had another boot when COV-19 happened. Online fresh food platforms have become one of the most popular industries, with much new business growing profoundly and lots of funds flowing into this industry. However, in early 2021, the authority had higher restrictions that prevented large internet companies from pouring too much money into the company to occupy the market and stop the price war—putting all the companies into healthy competition and becoming a competition of different business models used in the industry. What is the difference between the business models, and which ones are better?**

The paper has first discussed the critical aspects of online fresh food e-commerce: how to gain traffic, use of data, and build a better supply chain. The paper also has analyzed three different business models operating in the Chinese online fresh food industry using data and examples.

By now, there is a business model that increases more rapidly than others. However, which business models can perform the best in the future cannot be determined. The future of the Chinese online fresh food market is worthy of attention.

Index Terms—**The COV-19, the online fresh food e-commerce, traffic, data, supply chain.**

I. INTRODUCTION

In early 2020, the Cov-19 happened. Since February, most of the cities in China have in place a strict home isolation policy to fight the virus. In this challenging time being, the need for online fresh food delivery has increased rapidly. According to [2020 China internet "anti-virus" report] by Quest Mobile [1], in the 2020 Chinese spring festive, the daily active users using fresh food delivery app have increased to more than 10 million. Comparing with the Spring Festive in 2019, the daily active users have increased 91.46%.

The COV-19 has led to lifestyle changes. Many new business opportunities have been raised together with many problems needing to solve. Different industries have different issues. Many reports of different industries have analyzed its business models and impacts of the COV-19 virus. The business model of online recruitment in China has been discussed, and the post effects of CoV-19 have been raised. [2] The crisis of the airline industry was facing after the impact of COV-19 and has been discussed in previous papers. [3] The strategies development suggestion of the airline industries has also been discussed [4]. Meanwhile, there is little discussion of online fresh food platforms' business models and the changes since the COV-19.

This study discusses the problems and opportunities that the online fresh food platform industry faces and analyzes different business models in the industry. Three main vital facts affecting all the businesses in the industry are first discussed. Then three different business models using in the industry are analyzed.

The aim and objective of the paper are to explain and discuss the problems that Online fresh food e-commerce are facing and getting suggestions on its future development with the discussion of the different business model.

II. DATA AND METHODS

A. Data

Though online fresh food e-commerce has become popular these years, the business started quite early in 2005. In 2005, many food safety problems happened in China, which allowed entrepreneurs to use safety as the gap start doing online fresh food business. The first boosts of online fresh food business were between 2012 and 2013 when mobile internet got popularized in China. Also, with the development of old chain supply, online fresh food e-commerce expands quickly—the market size grown from 18.8 billion RMB to 82.8 billion RMB between 2012 and 2013. There are reports that analyzed the Sales Model of Fresh Agriculture Food Based on Business-to-Business E-commerce Platform back in 2015 [5]. The second boots are around 2018, when the Z generation is getting older, their consuming power expands.
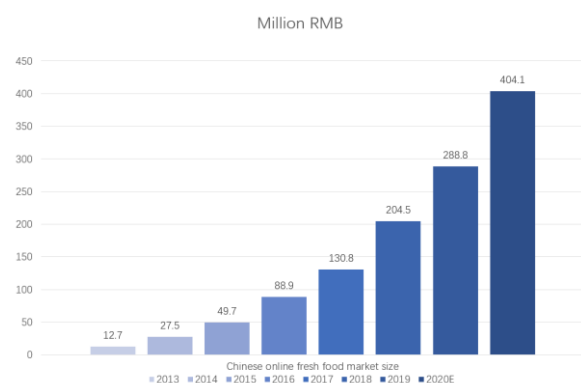

Fig. 1. Chinese online fresh food market size.

Furthermore, with the high-speed development of the delivery system, the market size of online fresh food e-commerce keeps proliferating to about 288.8 billion RMB in 2019. The third boost is in the early of 2020 when COV-19 happens. Online fresh food platform becomes their only way of getting fresh food as they could not go out. In this period, the market size growth most rapidly.

Fresh food is essential to everyone's daily life, is the primary consumer industry, and the growth rate is increasing

stably. The average consumption rate of fresh food in China is around three times per day, higher than 2.5times per day globally. According to data from Euromonitor, the total market of the fresh food industry in China is around 5 trillion RMB, YOY is around 5%. The CAGR between 2014 and 2019 is 4.9%. The market size in 2022 is around 5.4 trillion RMB [6].
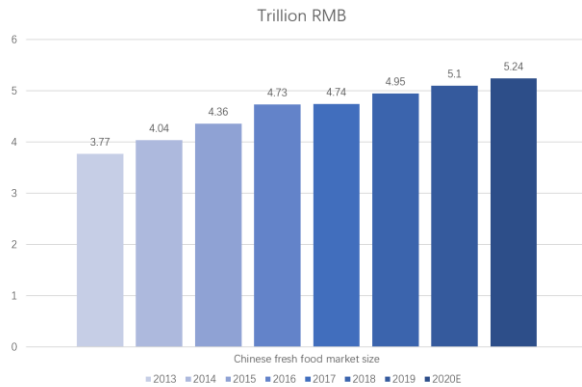

Fig. 2. Chinese fresh food market size.

The fresh Food market can the separate into three main parts, Famer's market, supermarket, and online market. The Famer's markets still have the most significant market shares, with about 56.1%. Supermarkets have about 38.8%of market shared while online platform only gets about 4.1%. This pattern has lasted because most often the one who cooked in a family is the elders, who do not often use mobile phones. They prefer to go to the farmer's markets or supermarkets to see the vegetables, making them more assured. However, though the 90s are getting married and having families, the portion of people willing to use online fresh food platforms increases; in addition, through the development of supply chain and delivery service, the market size of online fresh food will increase. Much online fresh food e-commerce has had its IPO in the past two years. The market size in 2019 is around 279.6 billion RMB, with a growth rate of 36.7% compared to 2018.

B. Methods

The case study methodology is particularly suitable for this study for three reasons. Firstly, this study aims to answer the question of online fresh food platform business will develop in China, belonging to the category of "how" questions. It is also appropriate to use the case study method to present the dynamic strategic transformation process. [7] Second, the purpose of the study is to analyze the problems that different companies face when they are using different business models and having different plans. Third, online fresh food delivery is still a rising industry and with endless possibilities. This study explores different opportunities in the industry based on the information and data today. The exploratory case study is especially appropriate for all new or existing academic fields that lack adequate research [8].

Since the internet boom, firms have been experimenting with new ways of doing business and achieving their goal. [9] The number of investigations on the business model has also increased. The paper has analyzed different business models in the Chinese online fresh food industry. Some of the business models are traditional, but most are new and unique.

The innovation of the business model is centrally important for business and national competitiveness and for the quality and standard of living around the world. [10] Especially for an industry like online fresh food, a good business model and a good company can benefit billions of people.

Selecting an online fresh food platform as the object of the case study is based on the following reasons. Firstly, is the importance of fresh food industry, is the basic need and is the base of all-consuming. The fresh food business is one of the largest industries in China, with about 5 trillion market value. Online fresh food platform only gets about 4.1 % of the total market shares, about 240 billion RMB. The market value is so immense, with even a one percent increase is a lot. Secondly, the fresh food industry is a long live industry. It has existed for thousands of years ago. Many analysts have analyzed the traditional online fresh food industry, [11] many new business models used in the industry have generated, the total analyst is not that much. Thirdly, the internet has made people changing their lifestyles. More and more people are shopping online; with the online community group buying business model, more elder people are willing to buy groceries through their phones. The online fresh food industry is a rising industry with infinite possibilities, which is the reason why it is appropriate to be researched.

III. RESULTS AND DISCUSSION

The first part will talk about the main problems and opportunities that all these types of companies face: how to gain traffic, the use of data and how to build a better supply chain, and other questions.

Firstly, compared with traditional markets, the online fresh food business is a new business that needs to attract consumers; traffic becomes the essential element.

All these online grocery shopping platforms face a critical aspect: gaining new customers and maintaining old customers.

Firstly, on how to gain new customers. There are two main types of ways. The first one is through the traditional offline stores, which can gain new customers by itself; the best example is Free Hema, the online grocery platform from Alibaba, it uses the idea of supermarket & online grocery delivery platform using the offline stores in big shopping malls as a way of advertising. Free Hema uses good & cheap seafood as the penetration point together with its parent company Alibaba's traffic to gain new customers. The second way is through marketing. The ground marketing model is still an effective way of marketing. With fresh food daily as the example of the online front-end warehouse model and JD to home as platform-based mode, both of these types lack offline traffic。 They are based on both offline and online advertising. The online part uses the traffic from leading internet enterprises like Tencent, Alibaba, Meituan to gain new customers. With Tencent using Wechat as an example of Social fission promotion. The third way is through Coupons, commonly used in the new business model, especially purely online front-end warehouses. The early stage of the new business model relies heavily on new user subsidies, commonly in large coupons or selected SKU newcomers. In order to increase user retention, merchants regularly offer coupons for different users, or In order to increase user

retention, merchants regularly offer coupons or exclusive items for different users to improve the repurchase rate.

The second important aspect is user retention. The first way is through members' subscription. Like MISS FRESH and DING DONG MAI CAI, the front-end warehouse model implements a membership system that binds users in depth through exclusive membership benefits, thereby enhancing user retention and promoting repeat consumption. The second way is expanding the category. After a period of model iteration, the online grocery business has transformed from a fresh food e-commerce business to an online integrated supermarket. The product categories cover fresh food, daily beverages, alcoholic beverages, grain and oil, casual food, and many other categories to meet the one-stop shopping needs of users. Data from Fastdata tells that from June 2018 to June 2019, the user stickiness of online grocery businesses has increased 22.7% [12].

One of the industry's issues is that the consumers of online fresh food are likely to be people in Tier 1 or tier 2 cities. Consumers from cities that except tier1 and ter2 are not likely to the consumer through online platforms, mainly because tier3 and beyond cities are much more minor and most likely have a store just next to where they live. One of the most significant advantages of online fresh food platforms is convenience, as consumers do not have to drive to buy groceries. However, in tier3 cities and beyond, consumers are likely to have more time than consumers in tier1&2 cities. In addition, the price on the online platform is likely more experience than in tier3&beyond's markets. Compared with consumers in tier1 cities. Consumers from tier3&beyond cities are much more price sensitive. So they are not likely to use the online platform。

Although the business model is only likely happening in tier1 &2cities, the market size is large enough, with more than a 200million people living in tier1 cities creates a large market.

There are cases using the business model of "online community group purchase" successfully operating in tier 3 cities. However, the price war between large online fresh food companies and the traditional fresh food market has been stopped through stricter restrictions. In the long term, consumers from tier3& beyond cities are likely to use traditional fresh food markets.

Secondly, compared with traditional markets, the online fresh food business has the advantage of accessible data that can be used easily. Traditional grocery markets have the problem of gross profit margin staying too low. The total gross margin of the traditional grocery market is about 20%, while the online fresh food business's gross margin only has about 15%, primarily because of the long industry chain and high attrition rate. Lower costs become the top priority of increasing gross margin. Now, with the help of AI and big data by empowering the front and back end of the chain to improve the operational capabilities of enterprises and reduce operating costs, thereby enabling enterprises to achieve higher levels of profitability.

In the front end, the platforms use fresh food as traffic generators techniques and introduce more CPG (customer packaged goods) to increase the ATV (average transaction value) and increase users' buying ability. Sorting also costs a lot; with the introduction of automatic packing, automatic sorting machines, low labor costs, and depreciation rates, the variable cost of the business can be reduced. The best example is Free Hema, with automatic conveyor belts placed on the ceiling of all the Free Hema stores. Lastly, using big data and user behavior accumulation, the algorithmic iterations can Improve the quality of recommendations and accurately estimate customer purchases reduce wastage, and improve inventory turnover.

In the back end, traditional supply chains have the problems of numerous circulation links, high attrition rates, and high marks up. With artificial intelligence and Big data analysts, the back-end costs are lower over time in these three main points.

Firstly, in upstream market relying on cloud computing, artificial intelligence technology, and other modern information technology with the integration of agricultural production products and through intelligent sensing and data analysis of the agricultural production environment, it enables precise management and visual diagnosis of agricultural production, as well as quality control from the source. At the same time, the development of scale and specialization in smart agriculture has led to an increase in the standardization and intensification of production, which provides the basis for large-scale procurement for new food e-commerce and can effectively reduce procurement costs. Data from Qianzhan research suggest that the market size of China intelligent agriculture in 2020 have gone up to 26.76billion us dollar, the CAGR between 2015-2020 is about 14.3% [13].

Secondly, in the midstream market, with the introduction of freshness prevention system, temperature control system, and intelligent warehouse management system, integrating various information into the internet platform to achieve transparency and atomization of the transportation. It has a high advantage of route optimization, intelligent dispatch, and many others.

In the downstream, with the help of an online intelligent dispatch system, the algorithms are optimized to get optimal route matching and optimal area dispatching, which improves delivery efficiency and reduces fulfillment costs.

Thirdly, online fresh food e-commerce has the advantage of having a better supply chain using data analysis and route calculation compared to traditional markets. The supply chain is essential to the online grocery business, especially the fresh food part. With all the online grocery companies in China, some are transformed from offline supermarkets, like Yonghui superstores and Free Hema. Especially Yonghui Superstores, one of the largest supermarket companies in China before it got into the online grocery business. These companies have high advantages on supply chains over the new business as the advantage cannot be set quickly. It profoundly depends on experiences as well as scale. The supply chain includes purchasing, experiences, number of buyers, delivery centers, manufacturing centers, and many others. Because there are too many complex parts in supply chains, many new internet companies have better intelligence supply chains and delivery centers; as their experience and scale are much lower, they fall behind traditional supermarket companies like YONG HUI superstores. This is also an important reason that most online grocery companies only operate in a small number of cities in China.

To explore supply chains, using Yonghui is used as an example. Yonghui has a complete national purchasing system and regional purchasing system. With the increasing contact between companies to farmers, the intermediate links in the fresh produce chain have been reduced. It not only leads to lowing storage fees and depletions costs but also guarantees the freshness of the agricultural products, increasing competitive price advantage. Purchasing channels can be classified as direct purchasing from the base, purchasing directly from the source, purchasing remotely, and purchasing from wholesale markets. Direct purchasing from the base has guarantee the quality and safety of fresh agricultural products. Purchasing from local is the unique feature of Yonghui. Yonghui works with the farmers directly, which lowers the purchasing costs, decreases the number of transportation segments, and increases efficiency. Remote purchase uses geographical differences of fresh agricultural products: time and seasonal differences, to get a lower purchasing price than traditional agricultural markets.

The opportunity and threats that the different types of online fresh food e-commerce business models are facing will be explained.

Firstly, is the to store + to home mode, also known as warehouse & store integration mode. The creation of the "supermarkets+ dinner" model has effectively lowered the attrition rate and rotting rate. It also increased the ATV as the food production on-site has put premiums on the foods. As the data from iresearch shows, in 2017, 34.9% of customers' ATV is around 201-300RMB in this new section which only 17% of customers' ATV is around 201-300RMB in the fresh food section. [14] This new model's innovation might solve the problem of the Fresh food business's ATV staying too low.

In this type of business, the need for a large offline store is essential, and choosing a place is also essential. Unlike front loader mode, where the warehouse can be chosen in an out-of-the-way location, "to store+ to home "mode needs the store to get as close as possible to customers and assure customers' dining experience. The advantage of these kinds of business models is that the store itself is an advertisement, as said before, how to attract consumer is the main issues which they are saying, opening big stores inside a crowded shopping mall is one of the best ways of advertising.

The business model has some main issues that they need to work through. Firstly, this kind of delivery uses takeaway deliveryman whose delivery distance is about 3km using an electric bicycle, which may lead to the shortage on the covered area. Secondly, as these stores are opened in the popular area which has rent fees. Though most of these stores have started earning, the up-front costs are too high to be covered. The cost of opening a 5000m2 store is about 50million RMB. This has limited the high-speed expansion of this business model. Thirdly, considering profits, though compared with traditional markets, the profits per meter2 are more enormous, and profit margins are larger. However, when compared to other models are still low. The leading cause is the high rent, high salary, and high depreciation costs. Lending to total profit margin staying low. The key ingredients of this business model to work through is to optimize the store's area trying to maximize the impact; increasing SKU and introducing products with higher profitability; decreasing fixed and variable cost by better management.

Secondly, the front loader mode is based on the regular delivery types with building a small warehouse near the customers as the delivery starting point. In this model, Merchants are delivered directly to the small warehouses near customers; after the customer has ordered from the platform, fresh foods can be sent directly from small warehouses nearby, which decreases the delivery time and lower the attrition rate. The delivery can be arrived in about 30 min.

The profitability of this business model significantly depends on the ATV (average transaction value) and gross profit margin. The ATV will increase when the storage place increase and SKU increase. When the amounts of products provided to customers increased, the customer will surely buy more products. The ATV of daily fresh, a leading company using this business method, has their ATV to about 80-90RMB. The other way to increase ATV is to increase the ability to choose products using data collected to determine whether a certain product should be increased or decreased.

The main issues this business model is facing is how to advertise; unlike the "to store + to home" mode, the front loader mode does not have a big and conspicuous store, It advertisement is based on sending a large volume of coupons to gain maintain customers. About 3% of its revenue is used in marketing and promotions. Though 3%donot seems much, the net profit margin is about 3%-4% for the fresh food business.

The weakness of this business model is that the up-front investment is tremendous, the cost of sending out coupons and marketing is tremendous. Some businesses using this business model are still in deficit. It is a heavy asset business model; the upfront cost of building the front storage warehouse, back large warehouse, and supply chain are costly, too.

This business model has the following advantages. Firstly, the revenue per meter2 is much larger than in traditional markets. The revenue per meter2 can get to about 100thousnds per meter2 per year while the traditional markets only can get about 10-20 thousand per meter2 per year. Secondly, the profit margin is high. The profit margin is around 20-30% now but with about 10% being used as subsidies. As time goes, when the subsidies decrease, the profit margin will increase. The attrition rate in this business model is lower than others to about 3%.

The key of these business models is to be as large as possible so the cost of the back storage warehouse and supply chain can be distributed.

Thirdly, the online community group-buying is based on social media, like WeChat groups. The group leader will be in charge of the selling and management business in the community. The delivery man will deliver all the orders to the group leaders, and consumers need to get their orders from the group leader instead of the deliveryman. Compared to those two business models, online community group-buying is new. However, it is the most popular one in the past years. Many big companies like Meituan, PDD have got into this business.

There are three main advantages of this business model. Firstly, the online community group-buying is through the

group leader whose commission fee is just 10% of revenue, while in another business model, the final kilometer delivery costs 12%. Also, in this business model, the advertisement and campaign are through group leaders, while in other business models, companies have to use 10% of revenue in advertising. Secondly, to consumers, the online community group buying does not have middlemen which the price of grocery is lower. In the meantime, the group leader is usually the consumer's neighbors who have known for a long time. Purchasing from someone they known makes consumers feel more assured. Thirdly, the community group-buying uses the pre-order system, which benefits more flexible cash flows and fewer operating assets. This business model is easier to be copied, too.

IV. CONCLUSION

With the growth of population and mobile internet development, the online fresh food industry will grow rapidly. The online fresh food industry only has about 4-5% of market shares in the total fresh food market in China; with future development, this number will undoubtedly be increased.

The paper has discussed vital facts that the companies from the industry are all facing, which is traffic, use of data, and supply chain. The paper has also analyzed three different business models in the industry, "to store+ to home" mode, "front storage" mode, "online community group purchase "mode. All these three models are now still working correctly, and both have their advantages and disadvantages.

By far, which of these three business models will increase the most in the future cannot be determined. Once they find the solutions to their problems and seize the opportunity, their market share will grow rapidly. The future of the Chinese online fresh food market is worthy of attention.

CONFLICT OF INTEREST

The authors declare no conflict of interest.
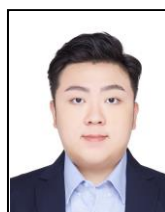
AUTHOR CONTRIBUTIONS

Qilong Zou did the research, analyzed the data, and wrote the paper.

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Qilong Zou was born in Shenzhen, China in 2000. He is an undergraduate student studying BSc accounting & finance in Norwich Business School, University of East Anglia, Norwich, UK.

He worked for China Reform Fund Management Corporations (Beijing) Ltd. in Operation Management Department as an intern during July 2021 to Sept. 2021. He worked for Tencent Technology (Shenzhen) Ltd. in the Department of Host Security as a business management intern during Aug. 2020 to Nov. 2020. He worked for Lee and Yu Certified Publican Accountants (Hongkong) as an intern accountant during July 2018 to Aug. 2018.