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Food e-commerce business models and sustainability in Chinese market

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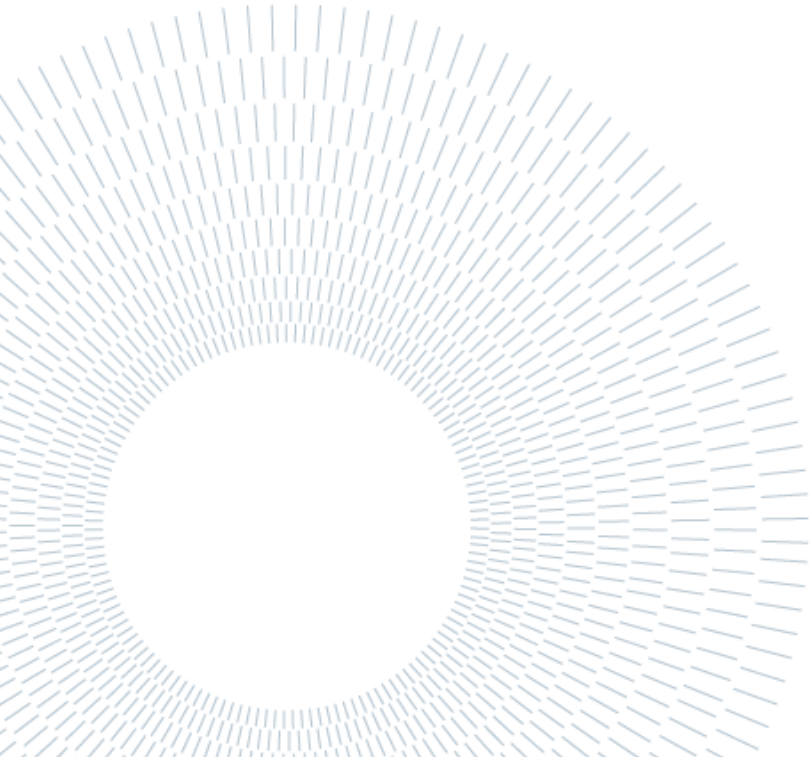


Abstract

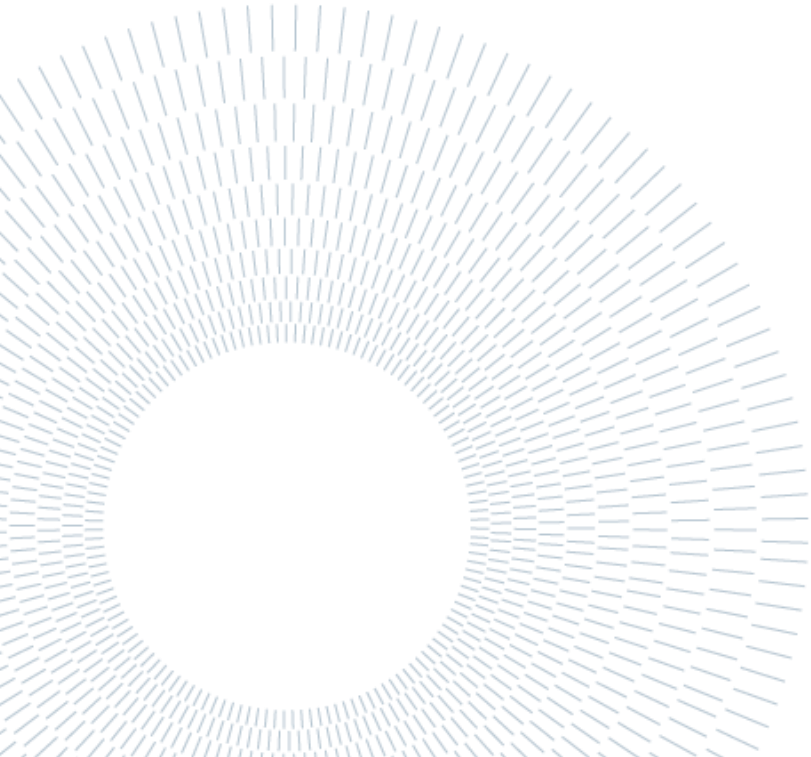
Food e-commerce is believed to keep developing and may have sustainability impacts in multiple aspects including transportation, energy use and food waste. Since sustainability s practical significance and impact on the development of companies, and the Chinese food e-commerce industry is of significant research value, there is value and significance in conducting sustainability research on this topic and market. However, there is a lack of research on the sustainable development of food e-commerce in China. Under the background, this thesis was conducted through an extensive literature review and an exploratory multi-case study approach with the aim of investigating the elements of different food e-commerce business models, the current state of sustainability of these food e-commerce business models and how they have been affected by the COVID-19 epidemic. Four cases in the Chinese food e-commerce market have been developed to address the research objectives. The thesis provides a comprehensive description of existing food e-commerce business models in China and discusses the implication of these food e-commerce business models on sustainability performance. The thesis further investigates how food e-commerce companies were affected by the COVID-19 and explored how they have responded to the challenges. The aim of this study is to assist practitioners in the food e-commerce sector in understanding how different business models are positioned in the direction of sustainability. In addition, the company's reaction to the COVID-19 can be incorporated into the case study.

Keywords: Food e-commerce, Business models, sustainability, triple bottom line, Chinese market, COVID-19

Abstract in italiano

L'e-commerce alimentare sta vivendo uno sviluppo continuo e potrebbe avere impatti sempre più rilevanti su diversi ambiti riconducibili alla sostenibilità, inclusi i trasporti, l'uso di energia e lo spreco alimentare. Nonostante la rilevanza sul piano pratico e in termini di ricerca dell'impatto della sostenibilità sullo sviluppo delle aziende e l'industria cinese dell'e-commerce, mancano ricerche che approfondiscano questo tema nel contesto cinese. Questa tesi è stata condotta attraverso un'ampia revisione della letteratura e un approccio esplorativo, attraverso alcuni studi di caso, con l'obiettivo di indagare gli elementi dei diversi modelli di business di e-commerce in ambito alimentare, lo stato attuale di sostenibilità di questi modelli e come sono stati colpiti dall'epidemia di COVID-19. Sono stati sviluppati quattro studi di caso nel contesto e-commerce alimentare cinese. La tesi fornisce una descrizione dei modelli di business di e-commerce alimentare esistenti in Cina e discute l'implicazione di questi modelli sulle prestazioni di sostenibilità. La tesi indaga come le aziende di e- commerce in ambito alimentare sono state colpite dall'emergenza COVID-19 e esplora come hanno risposto alle sfide connesse. L'obiettivo di questo studio è aiutare i professionisti del settore dell'e-commerce alimentare a comprendere come i diversi modelli di business sono posizionati rispetto alle prestazioni di sostenibilità, considerando anche la reazione dell'azienda all'emergenza COVID-19 .

Parole chiave: E-commerce alimentare, modelli di business, sostenibilità, triple bottom line, mercato cinese, COVID-19



Contents

Introduction

In food e-commerce, revenue may be lost due to the perishability of commodities, logistical constraints and inefficiencies such as order size, weight, and fragility (Rodriguez Garcia et al. 2021). The complexity of the multiple service types encompassed by food e-commerce also has implications for gas emissions and other more general sustainability. The food supply chain accounts for 26% of global man-made greenhouse gas emissions (Porter et al. 2016). This is primarily due to transport emissions associated with transporting goods of the food system. Foode-commerce also have an impact on the local environment related to traffic such as congestion and noise (Siikavirta et al. 2002). Food e-commerce may lead to increased food waste. This can happen if the customer is not present when the meal is delivered, or the order is not delivered in time (Fikar 2018). Research shows that people are likely to buy more food when they shop online (Tal and Wansink2013), which could lead to more food spoiling before it's used. Unwitting staff or poor platform design can lead to customers getting unwanted food, increasing the risk of food waste (Lee et al. 2021). However, by implementing eco-conscious practices, food e-commerce may also be more efficient than traditional brick-and-mortar grocery stores in terms of transportation, energy use, and food waste (MANICARDI 2020). Food e-commerce is a rapidly growing, evolving and changing global food system. Therefore, its impact on sustainability is difficult to determine. But it is certain that e-commerce in food will continue to exist and affect the sustainability of the global food system (Jiang et al. 2021).

Sustainable development is an important proposition in modern management and economic research. Thirty years ago, Malthus and colleagues (1972) were first introduced to the concept and importance of sustainability. They state that in a basically closed system like the Earth, it is impossible for the population, food production, industrialization, the exploitation of natural resources and pollution of the environment to continue to experience exponential growth without sooner or later collapsing (Colombo 2001). There has been an increase in attention to the sustainability theme since then (Barkemeyer et al. 2014). In fact, since the 1990s, the literature has been flooded with studies and definitions of sustainable development. The most recognized and widely used sustainability models are CSR, TBL, ESG, and SDGs (Mansell et al. 2020). Food e-commerce, a recently emerging industry, has grown with concerns about its sustainability performance

compared to traditional brick-and-mortar offline shopping Hio(Siragusa andTumino2022).

The earliest known concept and definition is Corporate Social Responsibility, also known as CSR. CSR efforts were a way to give back to society, often driven by marketing purposes or by individual initiative (Rangan et al. 2015). CSR was mostly seen as small-scale, specific activities, often outside the core of the business to care for the local community and the world (Blombäck and Wigren 2009). Trible bottom line, i.e., TBL, is another concept that is widely accepted and used by the academic community. It suggests companies to measure themselves on three dimensions: profit, people and planet (Kleindorfer et al., 2005 pp.482-92). In addition to reporting financial results, companies should measure and report their social and environmental impact (Yongvanich and Guthrie 2006). Environment, Social and Governance, or ESG, is a framework for sustainable development that follows on the footsteps of these two concepts. It evolved out of the financial industry and is pretty broad in scope (Crespi and Migliavacca 2020), including such issues as executive pay and diversity (Li et al. 2021). ESG is used predominantly by investors, often as a screening criterion and often seen by corporations as a compliance issue (Kotsantonis et al. 2016). On September 25, 2015, the United Nations officially adopted the 17 Sustainable Development Goals (SDGs), which aim to shift humanity to a sustainable development path by addressing sustainable development issues in an integrated manner between 2015 and 2030. While driving economic growth, companies in all countries face many challenges from social and environmental changes (Beckerman 2019). As a result, the search for a strategic approach to corporate sustainability has become a global issue (Girella et al. 2019).However, numerous studies and reports show the importance of researching and implementing sustainability for business growth. The 2017 Commission showed how pursuing the SDGs could unlock $12 trillion in new market opportunities annually by 2030, creating more than 380 million jobs in the process. "We need business leaders to use their tremendous influence to drive inclusive growth and opportunity. No business can afford to ignore this effort, and there is no global goal that cannot benefit from private sector investment." UN Secretary-General António Guterres said. "It was also noted that, in order to achieve the sustainability objectives of companies, business models have to be prepared accordingly. The need to fit with SDGs and globalization has made competition among companies more and more complex, with conventional business models struggling to find appropriate solutions to survive. In this context, the alternative concept of a sustainable business model may bring competitive advantage to organizations by enhancing conventional business models to achieve sustainable development while maintaining profitability and productivity (Nosratabadi et al 1663). According to research by Deutsche Bank, which evaluated 56 academic

studies, companies with high ratings for ESG factors have a lower cost of debt and equity; 89 percent of the studies they reviewed show that companies with high ESG ratings outperform the market in the medium (three to five years) and long (five to ten years) term. These leaders told us that they pursue sustainability because they believe it has a material financial effect. The value at stake from sustainability issues can be as high as 25 to 70 percent of earnings before interest, taxes, depreciation, and amortization. Sustainability leaders can and do change their business models to respond to major discontinuities, such as higher natural-resource prices or changes in demand, that create material risks to the business or opportunities (Fulton and Sharples 2012). Research has shown that companies with higher ESG ratings have lower costs of debt and equity, and that sustainability initiatives help improve financial performance while fostering public support. According to McKinsey, the strongest drivers for adopting a sustainable mindset in 2017 are aligning with the company's goals, mission or values; building, maintaining or improving reputation; meeting customer expectations; and developing new growth opportunities (Gillan and Starks 2021).

According to a report published by Reportlinker.com, The global food & beverages e-commerce market is expected to grow from $25.36 billion in 2020 to $31.25 billion in 2021 at a compound annual growth rate (CAGR) of 23.2%. The change in growth trend is mainly due to the companies stabilizing their output after catering to the demand that grew exponentially during the COVID-19 pandemic in 2020. The market is expected to reach $66.95 billion in 2025 at a CAGR of 21%. Due to the volume of the entire food e-commerce industry, the high growth trend and the importance of the food industry to mankind, it is necessary to conduct an in-depth study of the food e-commerce industry.

The Chinese food e-commerce industry has great potential for growth. As the world's most populous country, China has an extremely large e-commerce market for food e-commerce. According to the National Bureau of Statistics, China's resident food consumption reaches 3.1 trillion tons in 2020. With the improvement of people's consumption attitudes and the rise in consumption levels, the demand for quality fresh products and food e-commerce continues to grow. Chinese food retail market size exceeds 5 trillion yuan in 2020, of which the food e-commerce industry size reaches 458.49 billion yuan (Wang and Xu 2022). Although offline retailers such as supermarkets and groceries are still the main food retail channels (Wang 2021) leading to the low-penetration rate of food e-commerce, the growth rate of food e-commerce penetration is rapid, with an annual growth rate of more than 40%. With the maturity of the food e-commerce business model.

Chinese food retail market size exceeds 5 trillion yuan in 2020, of which the food e-commerce industry size reaches 458.49 billion yuan (Wang and Xu 2022). Although offline retailers such as supermarkets and groceries are still the main food retail channels (Wang 2021) leading to the low-penetration rate of food e-commerce, the growth rate of food e-commerce penetration is rapid, with an annual growth rate of more than 40%. With the maturity of the food e-commerce models, the development of users' online fresh food shopping habits, and the increasing level of technological sophistication, the online penetration rate of food procurement will gradually increase. There is still a lot of market potential and room for development (Wang 2021).

In 2020, the occurrence of the COVID-19 drives the rapid growth of the food e-commerce market size (Chen and Gao 2021). During the epidemic in early 2020, the number of times consumers used food e-commerce APPs rose significantly. After the epidemic subsided, the number of times consumers used fresh produce e-commerce apps dropped slightly but was still much higher than before the epidemic. This shows that the epidemic cultivated users' habit of using food e-commerce for consumption. The emergence of the epidemic has accelerated the online penetration of food procurement. In 2020, China's food online retail accounted for 14.6%, increasing 64.0% over 2019 (Wang and Xu 2022).

Considering the expanding market for food e-commerce companies in China and the importance of sustainability for business development. This study aims to take a case study approach to obtain the characteristics of food e-commerce business models and their sustainability initiatives through four interviews with Chinese food e-commerce companies, and to analyze their sustainability performance, as well as the impact and ad-hoc practices of food e-commerce companies in the face of the new epidemic. The study is divided into five sections.

This study is divided into 5 chapters. The first chapter introduces the concepts of e-commerce and sustainability and their related studies in the food industry through a literature review. The second chapter introduces the research objectives and research questions of this thesis, as well as screening the business models and sustainability measures of this study. The third chapter describes the methodology used in this study and the screening of interviewees. The fourth chapter reports the results from the within- and cross- case analysis and presents a discussion on the results obtained contrasting with the existing literature. The fifth chapter presents the limitations of this study, its practical contribution to reality, and future research directions.

1. Literature review

1.1 Sustainability in food supply chains

1.1.1. Defining sustainability

1.1.1.1. Sustainability framework

It is not a new idea that enterprises and organizations should pursue more than financial performances. Research as early as the post-World War II era has focused on the role of business in society (Maren 2008). Over the past few decades, sustainability has increasingly become a major research direction in management research and practice. Literature has widely emphasized that a socially responsible company must do more than making profits (Carroll 1991; Carrol 1998; Matten and Crane 2005). According to Carroll's sustainability model, managers, companies, and employers generally have four levels of responsibility: capital, legal, ethical and philanthropic (Carroll 1991). Carroll also recommends that organizations have these responsibilities to a broad range of "stakeholders, " including anyone who "has benefits, proposition, or interest in the operation or decision-making of the company" (Carroll, 1998 pp.1-7).

The most widely used definition of sustainability is that of the World Commission on Environment and Development Brundtland Commission (Brundtland 1987):"..... Development that meets the needs of the present without compromising the ability of future generations to meet their needs. "However, this definition is quite broad and difficult for organizations to understand and apply. In terms of sustainable development, a great deal of attention is paid to ecological perspectives, without explicitly taking into account the social aspects of sustainability (Carter and Rogers 2008). Therefore, on September 25, 2015, the 193 member states of the United Nations officially adopted 17 Sustainable Development Goals (SDGs) at the Sustainable Development Summit. SDG aims to fully address the social, economic, and environmental dimensions of development in an integrated manner between 2015 and 2030. This is so that humanity can shift to a sustainable development path.

In the broader context of SDG, different scholars and literatures have contributed different sustainable frameworks.

ESG principles are a framework that includes environmental (E), social (S) and governance (G) factors. In reviewing corporate behavior and future financial performance, investors often use ESG as a standard (Beerbaum 2021). In addition, ESG can also help measure the sustainability and social impact of business activities. As stated by the EBA (European Banking Authority), ESG factors are "environmental, social or governance matters that may have a positive or negative impact on the financial performance or solvency of an entity, sovereign or individual. " Thus, as a value of sustainability that balances economic, environmental, social and governance benefits, ESG seeks long-term value growth (Li et al. 2021). Guided by this framework, organizations must develop comprehensive and specific operating models for considering all these three aspects of environment, society and governance.

Reinhardt et al. (2008) and Bénabou and Tirole (2009) adopt the simple standard definition of CSR originally proposed by Elhauge (2005), which is the sacrifice of profit for the benefits of society. To do so, companies must go beyond legal and contractual obligations, on a voluntary basis. Thus, CSR encompasses a wide range of behaviors, such as being employee-friendly, environmentally friendly, ethically focused, respectful of the communities in which the company's plants are located, and even investor-friendly. Bénabou and Tirole (2009) comment that some CSR advocates argue that there are some profitable business cases for corporate social behaviors, while others discuss it as sacrificing some profits in pursuit of social benefits. According to Hopkins (2004) and Abd with colleagues (2011), CSR can be defined as treating the company's stakeholders in an ethical or responsible manner. Koestoer (2007) defines CSR as the way in which companies individually and collectively address various social issues in their areas of operation. Sriramesh and colleagues (2007) and Ismail (2011) report that Bowen (1953) is considered a pioneer in providing modern CSR literature, providing one of the earliest definitions of CSR as "the obligation of businessmen to pursue those policies that make decisions, or follow courses of action, that are consistent with our social goals and values". This framework requires the companies to formulate strategies which not only focus on profit, but also refer to the hopes and norms of society.

In addition to these sustainability frameworks, the most used model in academia is the triple-bottom-line framework (TBL). This framework is also the one applied in this thesis when discussing sustainability, and therefore will be described in detail in the next subsection.

1.1.1.2. The trible button line

The Triple Bottom Line refers to the economic bottom line, the environmental bottom line and the social bottom line, which means that enterprises must fulfill the

most basic economic, environmental and social responsibilities in the process of operation. This theoretical framework was first proposed by John Elkington in 1998: "From the perspective of microeconomics, it is stated that in the process of pursuing its own development, enterprises need to simultaneously satisfy the balanced development of economic prosperity, environmental protection and social welfare", Elkington (1998) believes that for enterprises, corporate responsibility can be divided into economic responsibility, environmental responsibility and social responsibility.

Labuschagne and colleagues (2005) define the economic responsibility for sustainable development as "an organization's impacts on the economic circumstances of its stakeholders and on economic systems at the local, national and global levels". Based on this definition, when thinking about the economic dimension in TBL, it should include not only the corporate value and efficiency already reflected in financial reports, such as increasing profits, paying taxes on time, paying dividends to shareholders and investors, and other indicators that can be directly reflected by the market (Hinton 2020), but also the sustainable development impact of external economic systems, such as promoting national economic development (Deng 2010). As the basis of corporate performance evaluation, economic performance evaluation has been the most basic means of evaluating corporate performance (Jin and Jiang 2008). Considering the above description of economic responsibility, Sen (2013) suggests that sustainable economic performance can be evaluated through a series of financial or non-financial metrics to understand the financial flows between different stakeholders and the main economic impacts of the enterprise on society. Therefore, the economic dimension of TBL not only measures the internal economic development of the enterprise, but also needs to measure the economic impact on external context.

Social responsibility means paying attention to and caring for the needs of other stakeholders in the society (Windsor 2006). Oliver (1924) points out that enterprises should not only focus on the maximization of shareholders' interests but also take the maintenance of the reasonable rights and interests of other stakeholders as an important goal of enterprise development. Bowen (1953) believes that corporate social responsibility is the basic obligation of corporate development, and business owners should take social goals and values as the basis in the process of decision-making and production.

Many experts and scholars also have their own views on the research on the content of social responsibility. Steiner and Steiner (1991) divide the content of corporate social responsibility into two dimensions: internal and external dimensions. The internal dimension is to protect the rights and interests of employees and improve

the working environment of employees. Actively participate in social activities, etc. Carroll (2000) believes that stakeholders such as shareholders, employees, partners, governments, customers, communities and the natural environment should jointly fulfill social responsibilities consisting of four parts: law, economy, ethics and charity. In the evaluation of corporate social responsibility, many stakeholders including people, organizations and institutions are inseparable, so it is necessary to evaluate the performance of enterprises from the perspective of stakeholders and building strong relationship in order to survive and develop better (Clarkson 1995). Peng and Ren (2003) take the company's behavior in employees, customers, suppliers, and social welfare undertakings as the main reference for the main social responsibility. By summarizing and analyzing the relevant information in these aspects, the relevant status of enterprises in undertaking social responsibilities can be obtained. By summarizing and analyzing the impact of internal and external stakeholders, such as employees, government, partners, etc., an evaluation of corporate social responsibility can be obtained.

Environmental responsibility focuses on the protection of the environment, which means that the enterprise is engaged in environmental protection, environmental pollution control, resource utilization and conservation, etc. at the same time in its business activities (Ye 2007). Businesses seek to "create a harmonious relationship between their natural and social environments, they seek to systematically renew natural resources and minimize waste and pollution" (Shrivastava 1995). Lewin and Bak (1993) believe that if enterprises want to develop better, ecological performance is very important, so it needs to be paid attention to. When analyzing the performance of enterprises, Martinez (2012) not only analyzes the economic performance of enterprises, but also studies the environmental performance together, and finds that environmental protection must become a part of the long-term development strategy of enterprises. Recent research investigating the adoption of environmental management practices by organizations shows that companies are increasingly concerned about their impact on the environment and adopt management practices to improve or reduce their negative environmental impact (Williamson et al. 2006; Welford et al. 2007; Sarkar 2008; Wahba 2008). Environmental responsibility is increasingly regarded as an important basis for corporate decision-making. Companies must consider the control of pollution discharge and resource use in the development process.

1.1.2. Measuring sustainability with the triple bottom line

The triple bottom line requires enterprises to pay attention to social and environmental indicators while paying attention to traditional financial indicators. That is, the triple bottom line requires enterprises to shift from a single profit

maximization goal to maximizing the overall goal of the economy, society, and environment (Beltratti 2005 pp.373-86). The triple bottom line model is a relatively open model, on which many more specific and targeted new models can be innovated. Combined with the different characteristics of different enterprises, relevant measurement indicators can be added or eliminated in the overall model to achieve the purpose of measuring the performance of social responsibility of different enterprises (Xiao and Xu 2014). Therefore, TBL has been adopted by various industries including tourism and hospitality (Jones et al. 2016).

There is a difference of opinion among scholars as to how the three dimensions of TBL should be measured and using what metrics. Considering the topic of this thesis is food e-commerce, some metrics of sustainability will be listed below based on the studies and thesiss related to food and agriculture industry.

Liu and colleagues (2019) reviewed many studies related to TBL in various industries, including the food industry and listed sustainability criteria in three dimensions: economic, social, and environmental. Conventional supplier selection metrics mainly reflect economic dimensions, including product quality, cost, delivery, technology, production, service, and geography. Social responsibility performance shows an organization's impact on society, measured by employee interests and rights, health and safety, supportive activities from the company, local community impact and stakeholder impact. For environment-related criteria, pollution production and control, resource consumption, and eco-design are considered meaningful.

Tiwari and Khan (2019) monitor five sampled task locations in three seafood-manufacturing companies in India and accounted for performance metrics from the triple-bottom-line model to assess corporate sustainability. Included in the study are four economic indicators, which are operating time, cost of operations, sustainability checks per transaction and losses of materials; three important environmental sustainability performances, which are emissions and consumption of natural resources, safety measures and green standards; and three metrics for social sustainability, which are unfair employment practices, local community employment and gender balance in employment.

After consulting 15 experts, Thanh and Lan (2022) used the triple-bottom-line model as a framework to enumerate economic, social and environmental performance when selecting a sustainable Vietnamese xanthan gum supplier. Four economic performances were included in their study, which are Purchase cost, Delivery reliability, Product quality, Technology capabilities. Employment practices, health and safety, local communities' influence, and contractual stakeholders' influence are the social responsibility considerations suggested by experts. Pollution production,

resource consumption, Eco-design, and environmental management system are defined to evaluate suppliers' environmental performance.

Bui and Filimonau (2021) review many peer-reviewed academic publications and uncover all three pillars of TBL sustainability performance in commercial foodservice. Based on their study, the contribution of the commercial foodservice sector to the TBL sustainability is highlighted through eight themes: food waste management; food safety and hygiene; food allergy management; provision of healthy meals; local food use; employment of the disadvantaged; the well-being of (non)managerial personnel; and noise level management.

Ahmad and Wong (2019) aim to address the lack of industry-specific and applicable metrics for sustainability performance. They invite a wide range of experts from academia, research centers and industry to develop sustainability indicators for Malaysian food manufacturing. The social dimension of sustainability was also found to be more important for Malaysian food manufacturing, followed by the environmental and economic dimensions. Research considers labor rights, working conditions, labor wellbeing, labor satisfaction, customer wellbeing, customer satisfaction, community and society wellbeing and community and society satisfaction are the metrics for social sustainability performance. The research also reaches consensus on what environmental sustainability performance refers to - materials, energy, water and chemical use, air emissions, and water and solid waste. At the same time, cost and profit are the main measures of the economic dimension.

Manning and Soon (2016) identify mechanisms for using a quantitative benchmarking approach to drive sustainability improvements in the food supply chain. They develop four TBL performance indicators for the economic dimension, which are promotion of economic growth, profitability, return on capital and employee engagement. Reduction in resource use, such as material consumption, water consumption and energy consumption is one of the factors of environmental sustainability performance recognized by many works of literature. Also, waste production needs to be considered when measuring environmental sustainability performance. When measuring the social dimension of sustainable development, the study proposes that Free association of labor community, quality of employment, and risk associated with use or consumption of products are important indicators.

Tarnanidis and colleagues (2019) collect data from 150 Greek food companies and use the method of conjoint analysis and developed a hierarchical framework, which presents the design and selected results of a comprehensive study measuring the concept of sustainable entrepreneurship, taking TBL as the theoretical framework. For Internal Social Value (ISV) and External Social Value (ESV) aspects, they list

something related to employment and social welfare, for example, job creation, foster training, equal opportunities, social needs, betterment of life and cultural norms. For Environmental Value (ENV), they think the important performances to measure are Goods with low environmental impacts, Save energy, Alternative sources of energy, Gas emission, ecologic goods and recyclable packing. The main measures of Economic values (ECV) are Long-run profits, consumer rights, financial maximization and price to quality.

The above textual information is summarized in the table below.

Table 1: The sustainability metrics under triple bottom line

	Metrics	**Measures and Reference**
Economic	Cost	* Net price, Maintenance cost, Logistics cost, Order change & cancelation charge (Liu et al.) * Raw materials, Packaging materials, Fixed assets' depreciation, Maintenance, Environmental fines, Utility, Defective products, Research and development, Training, Advertisement and promotion (Ahmad and Wong) * Cost of operations (Tiwari and Khan) * Purchase cost (Thanh and Lan)
	Profit	* Revenue, Profit, Subsidy or tax relief from government (Ahmad and Wong) * Profitability, Return on capital (Manning and Soon) * Long-run profits (Tarnanidis et al.)
	Quality	* Product reliability, Defect rate, Quality control system (Liu et al.) * Product quality (Thanh and Lan) * Price to quality and Follow standards (Tarnanidis et al.)
	Financial	* Financial conditions, Financial assets availability (Liu et al.) * Financial maximization (Tarnanidis et al.) * Economic Growth (Manning and Soon)
	Service level	* Delivery and Service (Liu et al.) * Delivery reliability (Thanh and Lan)
	Production	* Production capacity, Production/manufacturing facility (Liu et al.) * Operations Time and procurement process (Tiwari and Khan)
	Technology	* Design/co-design ability, Technical capability, Manufacturing capability (Liu et al.) * Technology capabilities (Thanh and Lan)
	Losses	* Loss of materials (Tiwari and Khan) * Food waste management (Bui and Filimonau)
Social	Labor rights and interests	* Employee contract, Employment Insurance, Employment compensation, Standard working hours, Overtime pay (Liu et al.)

		* Labor rights, well-being and satisfaction, Working Conditions (Ahmad and Wong) * Unfair employment practices, Gender balance in employment (Tiwari and Khan) * Employment practices (Thanh and Lan) * Quality of employment, Free association of labor community (Manning and Soon) * Equal opportunities (Tarnanidis et al.)
	Safety	* Health and safety (Liu et al.) * Healthy food, Safe food, Labeling (Ahmad and Wong) * Health and safety (Thanh and Lan) * Healthy meals, Food safety, Food allergy Management (Bui and Filimonau) * Risk associated with use or consumption of products (Manning and Soon) * Safety hygiene (Tarnanidis et al.)
	Social wellbeing	* Local communities influence of Health, Education, Housing, Infrastructure, Regulatory and public service, Social cohesion (Liu et al.) * Community and society wellbeing, Community and society satisfaction (Ahmad and Wong) * Local community employment (Tiwari and Khan) * Employment of the disadvantaged, Noise level management (Bui and Filimonau) * Social needs, Social changes (Tarnanidis et al.)
	Stakeholder influence	* Stakeholders influence of Procurement standards, Partnership screens and standards, Stakeholder empowerment, Stakeholder engagement (Liu et al.) * Customer wellbeing, Customer satisfaction (Ahmad and Wong) * Contractual stakeholders' influence (Thanh and Lan)
Environmental	Environmental management system	* ISO 14000 certifications or other environmental certifications, Environmental policies and programs (Liu et al.) * Green standards (Tiwari and Khan) * Environmental management system (Thanh and Lan)
	Pollution	* Production of air emission pollution, Production of wastewater, Production of solid wastes, Environmental remediation, End-of-pipe control (Liu et al.) * Air emissions, Solid waste (Ahmad and Wong) * Pollution production (Thanh and Lan) * Waste production (Manning and Soon) * Gas emission (Tarnanidis et al.)
	Resources	* Consumption of energy, Consumption of raw materials, Consumption of water (Liu et al.)

		* Material used of Raw materials, Primary packaging materials, Secondary packaging materials, Biodegradable packaging materials, Energy used, Water used, Chemical used (Ahmad and Wong) * Consumption of natural resources (Tiwari and Khan) * Resource consumption (Thanh and Lan) * Material consumption, Water consumption, Energy consumption (Manning and Soon) * Save energy, Recyclable packing (Tarnanidis et al.)
	Eco-design	* Reusability, Biodegradable products, Use of recycled materials, Use of hazardous material (Liu et al.) * Eco-design (Thanh and Lan) * Goods with low environmental Impact, Alternative sources of energy, Ecologic goods, Goods Environment Friendly (Tarnanidis et al.)

1.2. E-commerce in the food industry

1.2.1. The content of food e-commerce

Casellati (1997) argues that e-commerce of food products as food e-commerce, refers to the direct sale of fresh products, such as fresh fruits, vegetables, and fresh meat, on the Internet by means of e-commerce. Sun (2021) holds the view that food e-commerce as an e-commerce model that focuses on the sale of food such as fruits, vegetables, meat, and seafood, which is generally delivered directly to the consumer terminal by self-operated logistics or third-party logistics. While Chen (2018) argues that in the Industry and Technology Forum food e-commerce is the use of e-commerce tools to sell fresh fruits and vegetables, seafood, and fish directly over the Internet, Geng and his colleagues (2020) argue that food e-commerce is an evolving form of e-commerce, where merchants need only have business qualifications and level verification on the Internet to buy and sell products such as fruits and vegetables, and the difference from traditional e-commerce is that it requires high-quality logistics services. According to the case study of SF Express, Lun and his colleagues (2018)showed that food e-commerce can be a practical and safe food trading process based on seven models: integrated e-commerce platform, logistics e-commerce, food supplier, vertical e-commerce, farm direct sales, offline supermarkets, community e-commerce and cold chain logistics storage line, with word-of-mouth as the breakthrough and cold chain logistics storage as the technical means, through information dispatch and logistics transportation and distribution.

The thesis defines food e-commerce as the process of delivering fresh products to consumers via traditional delivery methods such as warehouses, in-store, or at home by using the Internet as a means of delivering fresh products through traditional delivery methods such as warehouses, in-store, or at home.

According to the Food And Beverages E-Commerce Global Market Report 2022, with an increase in technology and changing human interaction with any product or service, online shopping and web surfing for food products or services is diurnal. This is positively affecting the food e-commerce, in 2019, it is estimated that there are 1.92 billion digital buyers, and e-commerce sales account for 14.1% of retail purchases worldwide and are expected to rise to 22% in 2023. 80% of consumers prefer detailed information about purchases and considered this crucial to make buying decisions. Hence this trend will boost and increase the scope for online food and beverage businesses. According to the Absolute Report, the global Food E-Commerce market size was valued at USD 200629.09 million in 2021 and is expected to expand at a CAGR of 18.87% during the forecast period, reaching USD 566038.25 million by 2027. Major players in the food and beverage (F&B) e-commerce market

are Amazon Fresh, Peapod, Google Express, Walmart, Pepsi Co, General Mills, Nature Box, Thrive Market, Costco, and Kroger.

China is the world's biggest e-commerce market, led by e-commerce subsidiaries of the Alibaba group – Taobao, Alibaba.com and Tmall. With an annual growth rate of 21%, China is also one of the fastest-growing e-commerce markets. The overall transaction size of China's fresh food e-commerce market has been growing year by year with the continuous development of Internet and cold chain technology, from 12.7 billion yuan in 2013 to 204.5 billion yuan in 2018, with a compound annual growth rate of 68. 39% (Liu 2022). The early start-up phase was dominated by vertical fresh produce e-commerce platforms, mainly Ego Fresh, COFCO I Buy, etc. The business scope gradually expanded from fruits and vegetables to a variety of categories, with not only self-built warehouses but also self-built production bases and distribution logistics in some cases. 2014-2015, the fresh produce e-commerce market received high attention from capitalists, with Tmall Supermarket and Suning Tesco as the representatives of comprehensive e-commerce platforms for all categories online. Relying on the huge traffic base of their platforms for sales, the fresh produce e-commerce industry entered a period of rapid development (Sun 2021). As competition intensified, some small and medium-sized fresh food e-commerce enterprises closed down or merged, and the market layout was reshuffled. Following this, traditional fresh food retail industry giants such as Yonghui joined the New retail innovation model layout, actively investing in the cold chain and supply chain of fresh foods and promoting the rapid development of the upcoming e-commerce model.

At this stage, the development of the e-commerce industry is centered around food e-commerce, live streaming with goods, and the netroots economy. Favorable factors such as changing consumer perceptions, gradual improvement of supporting facilities and policy support have accelerated the market penetration of domestic fresh food e-commerce (Zhang 2022). According to iiMedia's survey, the market size of China's fresh food e-commerce industry will be 311.74 billion yuan in 2021, up 18.2% from 2020. With strong consumer demand for online fresh food purchases during the epidemic and deepening user trust in the fresh food e-commerce industry, China's fresh food market size is expected to reach 419.83 billion yuan in 2023.

1.2.2. E-commerce food supply chains

Generally speaking, food supply chains (FSC) refer to the system of organizations, people, activities, information, and resources involved in producing and/or moving food products from harvest to consumer (Grocery Manufacturers Association, USA, 2008).

Zhou and Gu (2007) described the food supply chain as a mesh structure containing source supply enterprises, production and processing enterprises, distribution and transportation enterprises, as well as other related enterprises that organize the food supply chain into four modules: food production and processing, food marketing, food distribution, and consumer demand. Wang (2017) contends that food supply chain is a supply chain model that is created by treating food as a type of good and letting it flow through various supply chain links.

Meng (2010) gave their own definition of the food supply chain after research, proposing a top-down supply and demand network that links source suppliers, production manufacturers, product sellers, product transporters, and product retailers together.

Based on the literature, this thesis describes the food supply chain as a network chain model beginning with design and R&D and continuing through six links: source supply, production and processing, transportation and distribution, consumption and return, which link all related enterprises together. The operation of the entire food supply chain is dynamically adjusted according to the continuous changes in the internal and external environment. Since food is different from other commodities, it is perishable, seasonal and geographical, which makes the food supply chain different from other commodity supply chains. Wang (2017) summarizes the characteristics of the food supply chain: dependence on the natural environment, shorter turnaround time, high standard of transportation and storage equipment, high uncertainty, strict quality requirements and high risk.

The FSC network differs from other product supply chains. The primary difference between FSC and other supply chains is the constant and consequential diversity in the quality of food products all around the entire supply chain through the points of ultimate consumption (Iakovou et al., 2016). In order to achieve robustness, supply chains must manage distractions effectively. Early stages of food production can be negatively affected by climate change and adverse weather events, such as changes in precipitation patterns and temperature, drought, as well as heavy rains and heat stress (Adejuwon, J.O. 2006). Food containers can significantly affect food waste and carbon emissions during transportation (Haass et al., 2015). Using automated networked vehicles for the delivery of commercial food can enhance the sustainability of the FSC (Heard et al., 2018). Research on agricultural sustainability should focus on ecological, social, and economic factors (Becker & Ellis, 2017).

With the rapid development of e-commerce and other emerging industries, in recent years, major e-commerce platforms have started to introduce fresh food products, which has triggered more and more scholars to start research on the e-commerce food supply chain. Chen (2022), based on the combing of existing

literature, came up with the following basic models of e-commerce food supply chain: e-commerce enterprise and farm base model; e-commerce enterprise and farmers model; e-commerce enterprise, cooperatives and farmers model, e-commerce enterprises, agricultural products processing enterprises and farmers model. Guan and her colleagues (2010) compared three models of e-commerce circulation of agricultural products and pointed out that B2C and C2C models would usher in the opportunity for further development.

1.2.3. Business models for food e-commerce

This thesis examines some different business models of food e-commerce around the world by reviewing literature, website, consulting reports etc.

The first is the inventory-based food e-commence business model represented by Grofers. This business model is dependent on the inventory management system. In the inventory-based business model, the eCommerce platform owner is responsible for purchasing and storing the inventory. The eCommerce business owner purchases the stock from different suppliers and stores them in a self-maintained warehouse. The product will be repackaged and shipped directly from the central distribution center in the suburbs of the city to the customer with the logo of the site, regardless of the vendors (Guncha 2021). Bhatia and Wazal（2016）introduced that in the inventory-based model, the e-grocers, on receiving the order from the customers, route the products to their warehouses. After the product reaches their warehouses, this is then delivered to the customers from their warehouses. Thus, it is the online grocery that is responsible from the moment the product order is received to the moment it is delivered. The model is expensive because it calls for a warehouse to be set up, quality controls, warehouse administration, and transportation. It is also possible to wash goods if they are not used within a defined timeline. For effective control of their product lines, players such as Big Basket often market private brands such as Fresho, the popular / Royal (staples). The inventory model looks more optimistic about the food e-commerce market considering the initial investments（Jain，2020）Another feature of this model is the high fixed costs and the need to build a large customer base quickly through expensive promotions and advertising schemes. In addition, packaging and delivery can cost up to $40 an order, and customers ordering less than $100 worth of groceries at a time are not profitable. This may present a real challenge to online retailers, since the average purchase in a traditional grocery store is less than $30 (Vickers, 2000).

Another business model that has emerged in China in recent years is the frontal warehouse food e-commence business model, which is also based on the warehouse

as the key operating system. The Frontal warehouse model consists of a central warehouse and Frontal warehouse. Based on forecasts of demand, the city center warehouse submits purchase orders to suppliers and the products are transported to the city centre warehouse via the trunk cold chain. After receiving a replenishment application from the Frontal warehouse, the goods are selected, sorted, orders are combined, goods are assembled and other operations are carried out. After this, they are transported to the Frontal warehouse in special refrigerated trucks. After the customer has placed a purchase request on the e-commerce platform, the management of the Frontal warehouse quickly picks and groups the goods according to the order information, and verifies and releases the packaged goods through the scanner (Heng 2019). Regarding the research on the location and distribution aspects of the Frontal warehouse, Dong (2020) used the fuzzy comprehensive evaluation method to determine the optimal location of the central warehouse based on the prediction of the logistics demand of the enterprise, and designed a genetic algorithm to solve the Frontal warehouse location model with the lowest total cost as the goal. Huang (2021) used system dynamics and other methods to optimize the location of the Frontal warehouse and the distribution path, respectively. Lu (2018) constructed a general framework for the integrated optimization of the Frontal warehouse distribution system by analyzing the characteristics of the Frontal warehouse distribution system and fresh produce and designed a genetic algorithm and a golden partition algorithm to verify that the "Frontal warehouse" distribution model has favorable economies of scale.

In Europe and the United States, Wal-Mart, Carrefour, LIDL and so on are the representatives of the traditional food supermarket model, and in China, Yonghui and RT-Mart are the representatives of the traditional food supermarket model. The traditional supermarkets' procurement is mainly based on direct sourcing, cooperative suppliers and planting bases, with statistics summarized according to demand forecasts and sent to the corresponding upstream suppliers, who prepare the goods according to the list, pack them uniformly and then transport them to the shops (Yang 2021). The traditional supermarket model is characterized by offline activities before the emergence of food e-commerce, and after the emergence and development of e-commerce, in order to better adapt to the current environment and maintain competitiveness, online channels have been launched to dovetail with the existing business environment and distribution of the purchasing population, and two models of home delivery and click-and-collect are introduced to meet consumer demand for safe or convenient shopping options based on conventional retail shops (Wang 2020). In the study of the transformation of traditional supermarkets to online, Wang (2019) concluded through case studies that supermarkets should play to their strengths and improve their competitive advantage through service transformation strategies. Yang (2019) stated that the key

to transformation is empowerment and pointed out that traditional supermarkets should mainly empower the three aspects of organization, technology and culture. Wang (2020) concluded that the transformation of traditional supermarkets should mainly focus on marketing.

Similar to the traditional supermarket model, the New retail food e-commence business model in China, represented by Hema Fresh, is often adopted by companies born in the Internet era to achieve a perfect integration of online and offline. With the concept of "New retail", it uses the online instant home and offline experience shop model. Not only do they offer online services such as home delivery, but offline shops also integrate dining and interactive experiences to create a stronger appeal and better service. Consumers can visit the physical shops to purchase experiences or place orders online and use the physical shops as warehouses for instant delivery. The supply chain of the New retail model differs from that of traditional superstores in that the shops simultaneously undertake to carry the five functions of supermarket, catering, logistics, experience and fan operation at the same time, and are also warehousing centers for online delivery, responsible for warehousing and distribution functions (Wang 2019). The types of logistics include ambient and cold chain logistics to support the temperature requirements of different fresh produce. It also uses computational models to find the optimal delivery routes, uses big data to filter out couriers that match the order information, and performs real-time tracking of order status (Yang 2021). Regarding the definition of New retail, Lock and his colleagues (2018) argue that enterprises use the internet as a basis to upgrade and transform the production, distribution and sales process of goods by using big data, artificial intelligence and other advanced technological means, thereby reshaping the business structure and ecosystem, and a new model that deeply integrates online services, offline experiences and modern logistics. Wang (2017) interpreted the essence of New retail as an integrated retail format that better meets the multi-dimensional needs of consumers for shopping, entertainment and social interaction in an era of data-driven and consumer upgrading, with an omnichannel and pan-retail format. It also summarizes the three driving factors of New retail: information technology, consumer demand and competitive dynamics. In the research on the supply chain aspect of the New retail model, Liu (2021) used game theory to study the coordination and game between the various stakeholders in the supply chain, researched the relationship of interests in the cooperation of various channels coordinated by New retail enterprises, and designed relevant schemes to achieve supply chain coordination. Shan (2017) studied the optimization of the delivery cost, delivery time, and delivery quality of the fresh food e-commerce end of the New retail model through data analysis, respectively. Yang and his colleagues (2022) point out that the development of the supply chain requires the establishment of a

digital supply chain platform, the application of big data to tap the value of data, and the perfect combination with the Internet of Things and the supply chain.

With the rise of the e-commerce platform-based model, the multi-vendor marketplace food e-commence business model has also emerged in the food industry, where companies are accountable for building a platform that connects suppliers and consumers in need. It is a public platform for multiple buyers and sellers where the company owns or Suppliers and buyers register and transact through a dedicated online grocery website or app (Jain, 2020). In this scenario, either the seller is responsible for packaging & dispatching, or after the packaging has been delivered. In this form, either the seller is responsible for packaging & dispatching, or after the seller packages, the owner of the multi-vendor marketplace handles dispatching. DUVAL（2022）noted that this model is also appealing for smaller food retail chains that can develop consortiums and cooperatives to develop and manage a joint e-commerce infrastructure allowing customers throughout a city or throughout the United States to order via a unique website. In fact, the Internet may be a key ingredient in the survival of small food retail and independent grocery stores. This is provided these companies are willing to cooperate with each other.

Another very similar business model is the shopping food e-commence business model. In the global economy, the shopping model is the most popular alternative. Nearly any giant in a hybrid shape fits this model. There are subtle differences between the multi-vendor marketplace model and the shopping model. Customers choose the supplier they want to buy from in a multi-vendor marketplace model, while in a shopping model, consumers don't decide from which retailer they want to purchase product before placing their order. The application controls its own distribution system. If the order is issued, the company passes the information to its vendors, whose task is to buy and distribute the goods to its clients（Jain 2020）

The supply chain of a platform-based business model is relatively simple and consists of four main components - the O2O platform, the restaurant or supermarket, the delivery courier and the customer. Each component has a different role to play. The O2O platform at the center is responsible for the development and operation of the entire platform, including setting up the evaluation system, after-sales service and courier management. Marketing is also necessary to attract food vendors to the platform and customer traffic (Xing and He 2020), and the main source of revenue for the platform is the service fee paid to the platform by customers when they purchase goods, which also includes the amount the platform will pay to the couriers for delivery (Sun 2017). Food and beverage merchants, who are food suppliers, prepare and deliver the products that their customers need after they receive an order from them through the O2O platform. After the merchant has

finished preparing, the goods are handed over to the platform courier. This person takes that order for delivery, and the merchant is essentially only responsible for deciding on the price of the product and producing the goods (Xing and He 2020). The couriers responsible for delivery. They pick up the prepared food from the merchant and deliver it to the customer. They receive a fixed delivery fee and incentive bonus from the platform. Couriers are usually employees directly managed by the O2O platform, while at certain peak times there are also couriers from outsourced companies who become temporary carriers (Sun 2017).

The last is the community group buying food e-commence business model that has recently emerged in China. Online group buying refers to "an e-commerce model that organizes buyers with the same needs and purchase intentions over a period of time through an e-commerce platform, forming a large number of purchase orders and strong bargaining power to collectively purchase and enjoy price discounts. Working together to safeguard rights and interests" (Tang and Jiang, 2011 pp. 30-31). In the online group buying model, consumers are eligible to negotiate and receive price discounts with sellers (Yuan 2004). The community group-buying model of food e-commerce is an offshoot of online group-buying, which emerged to meet the demand for online procurement of fresh food at low prices. At the same time, given the short shelf life and perishability of fresh food, merchants initiating group buying activities limit the geographical distance of participants. The community group-buying supply chain system consists of suppliers, community group-buying platforms, chiefs and consumers. The suppliers are mostly agricultural cooperatives and food production plants. The group leaders are mainly made up of shop operators such as community convenience stores, courier sites and freelancers. Group leaders earn commissions by promoting the platform as well as the products, and are also sites where consumers pick up their own goods. Suppliers provide products to the community group buying platform based on their customers' ordered demand aggregated by the platform, and the community group buying platform is responsible for the transportation and flow of the products, which are delivered on time the day after the customer places an order to the group leader's pick-up point, where the consumer collects the goods (Wang and Li 2022). Scholars have offered their views on what factors influence the final outcome of group purchases. Scholars generally agree that consumer intention is the main factor that influences online group purchase behavior (Cheng and Huan 2013; Hsu and Chan 2014). In addition to the most important measure of discount rate (Wang et al. 2014), product category (Grandhi et al. 2014), product quality (Zhang et al. 2013) and product heterogeneity (Tran and Desiraju 2017) are all highly weighted when consumers are considering whether to participate.

Table 2: Food e-commerce business models

Food e-commerce business models	Main characteristics	Examples
Inventory-based food e-commence business model	The food is stored in the company's inventory Purchases from other suppliers Delivery from the distribution center A high level of fixed costs Costly packaging	Grofers Bis basket Fresho
Frontal warehouse food e-commence business model	Center warehouse and frontal warehouse Short distribution time Food process in frontal warehouse Frontal warehouses are around the community	Daily Fresh Dingdong Pu Pu Yiguo
Traditional supermarket business model	Sales are primarily conducted offline Suppliers pack and send product Newly available on the online channel	Wal-Mart Carrefour RT-mart
New retail food e-commence business model	Internet background company Data-driven and intelligent retail environment Provide food processing, catering and other services Advanced cold chain logistics system	Hema Fresh 7 Fresh Super species
Multi-vendor marketplace food e-commence business model	Public platform connects buyers and sellers Does not own inventory Customers can choose suppliers Sellers are responsible for packing and shipping	East Zomato Uber eat Food panda
Shopping food e-commence business model	Public platform connects buyers and sellers Does not own inventory Customers cannot choose suppliers Sellers are responsible for packing and shipping	Instacart Baskyt Tmall JD
Community group buying food e-commence business model	Pre-order model Next day delivery Bulk purchase for discounts Group leader receives product from supplier Customer self-picks up	Shixing Fresh DuoDuo Maicai Nice Tuan

1.3. literature gap

After studying the existing literature on Chinese food e-commerce and sustainability, the literature gaps are obvious to point out. There is a lack of integrity in the existing literature and research on the mainstream BMs and the food e-commerce industry in China. Usually, when articles talk about business models in food e-commerce, only 1-2 BMs are mentioned and only a few aspects of the BMs are discussed. The literature does not provide a complete description of every business model from all aspects. There are no comprehensive comparisons of all mainstream models available in the literature.

The existing literature and research do not provide a systematic assessment of the sustainability performance of the entire food e-commerce industry and each BM in China. There is a greater emphasis on how to make enterprises profitable than on studying the specific practices of social and environmental responsibility and their implications. Some articles mention specific sustainability practices, but the analysis is limited. This is because it often involves companies trying to reduce costs through these actions or increase sales by projecting a positive image.

2. Research design

2.1. Objectives and Research Question

As mentioned in the previous chapters, food e-commerce has a large market and prospects in China and is an area worthy of focus. However, the current domestic and foreign literature lacks a clear definition and comparison of the various business models of food e-commerce, so that the classification of food e-commerce business models is confusing, and many similar or almost identical business models are given different names and research contents. Previous literature analysis also highlighted that sustainable development is an important research area with huge and far-reaching implications for all stakeholders, and there is a need for further exploration. However, in terms of academic research on the sustainability of food e-commerce, the specific measures that lead to the different sustainability performances of food e-commerce business models have not been fully investigated, and the impact of these measures on sustainability is rarely addressed. In addition, the COVID-19 pandemic has had a huge impact and impact on many industries. The food e-commerce industry is also one of them. With the outbreak and China's domestic lockdown policies still in place, research on the impact of the COVID-19 pandemic on the industry is necessary and meaningful.

The relevant knowledge that can be obtained from the literature for the above research directions is sparse and incomplete, so the topic needs to be approached from a more practical perspective, that is, through interviews with relevant business executives. The interviews and this article focus on qualitative research that expands existing academic boundaries and supports future academic topics.

The purpose of this thesis is to have an in-depth understanding and comparison of the business elements at the operational level of the existing food e-commerce business models and to study the specific practices of different food e-commerce and their impact on sustainability performance, thus learning more about the sustainable development of the food e-commerce industry. At the same time, this article also covers the impact of the COVID-19 on food e-commerce.

With these purposes in mind, the research questions that have guided the present study are:

- **RQ1**: What are the existing food e-commerce business models in the Chinese market, and what are their characteristics?
- **RQ2**: How do food e-commerce BMs affect sustainability performance?

- **RQ3**: How has COVID-19 affected the food e-commerce industry and what practices has been taken by companies in the food e-commerce industry in reaction?

2.2. Research Design

2.2.1. The selected business models of E-commerce

The previous sections mentioned food e-commerce business models that are currently widely used both domestically and internationally. However, several of these models operate in a very similar manner and thus was grouped into the same category in this thesis. The following paragraphs present the categories of food e-commerce business models adopted in this thesis, reporting the business models included in the category.food e-commerce business model

The first category discussed in this article is the Frontal Warehouse. This mode contains the two modes mentioned earlier: inventory-based model and Frontal warehouse. The reason why the two models are considered the same category is that both models operate by anticipating customer demand, whereby companies buy and hold inventory before selling (Qiu 2020; Kumar and Shrivastava 2021). Both models center their business activities around a warehouse system with no or almost no offline sales stores (Zhao et al. 2021). Inventory management is the core capability of both models. (Sun et al. 2019; Jayakrishnan 2022). The Frontal warehouse is an upgraded version of the inventory-based model. It is a business model that operates online through the headquarters of the company and delivers the customer orders to its warehouses nearby the community, which is one of the effective ways to solve the problem of last-mile delivery (Zhao et al. 202). The forecourt model is adapted to China's urban layout and population density by creating a multi-level storage system. The last level of warehousing is very close to residential areas (Zhao et al. 2021), which can greatly speed up distribution, but also increases fixed cost investment.

The second category of food e-commerce business model is New retail. this model also contains the two previously mentioned models, supermarket and store warehouse integration. the reason for combining the two models in the same category is that both are complete with online and offline sales channels and are of equal importance (Wen 2018). It is necessary to clarify that the supermarket is the traditional channel for food purchasing, and in recent years, the online channel has been added to meet the market demand for electronic purchasing. Store warehouse integration, on the other hand, is born digital, i.e., a new model that accompanies the birth of online purchasing demand. Therefore, there is a slight difference between the two in terms of the ratio and strategy of online and offline sales (Lin et al. 2019). The New retail model is centered on consumer experience and connects various consumption scenarios through data. It provides consumers with a seamless consumption experience covering all channels (Zhao and Xu 2017).

Typically, offline channels focus on interacting with customers and providing a broader range of experiential consumer services to drive traffic and increase loyal customers for online channels (Luo 2018).

The third category of food e-commerce business model is Platform-based models. this model contains the two previously mentioned models, namely the multi-vendor model and the shopping model. In both models, food demand and supply are connected through a platform (Chen and Li 2016). The slight difference between the two is whether the customer specifies the store or supplier to buy the food. The platform-based company itself does not offer or sell any products, but only manages the platform and is responsible for the scheduling of delivery couriers (Liu et al. 2021). Merchants enroll in the platform, and the platform attracts customer traffic through promotions to place orders. After a customer places an order, the platform notifies the merchant to prepare the goods and dispatches the couriers belonging to the platform to pick up the order from the merchant and deliver it to the customer. Compared with other food e-commerce business models, the platform-based model has no steps to purchase and resell products and does not own products. Therefore, there are no fixed costs, and no need to consider the loss rate and inventory (Fang and Yang 2017), which has an advantage in terms of cost control. However, as with all platform-based models, how to attract and sustain both the merchant and customer ends is the most important issue to consider (Pan 2020). In addition, the optimization of courier scheduling and outsourcing issues are also issues that need to be considered for the platform-based model (Lou 2021).

The last category of food e-commerce business model is Community group buying. This is a relatively independent and new model. Unlike the immediate delivery of the previous three models, community group buying companies use a pre-order model, collecting customer demand orders before centralizing procurement and delivery, which usually arrives the day after the order is placed (Li and Sun 2020). Currently, many Chinese fresh food e-commerce companies are transitioning to this model and trying to explore a more optimal version of its solution. Due to the advantages of the sales price to customers and cost control to companies, the community group buying model has unanimously been accepted by the majority of food e-commerce companies and consumers, despite the sacrifice of delivery speed on a certain basis (Shen 2020).

Table 3: Summarized food e-commerce business models

Name of the category	Included models	Characteristics	Reference
Frontal Warehouse	Inventory-based food e-commence business model	Anticipating customer demand, the company buys and holds inventory first, and then sells it	Qiu 2020; Kumar and Shrivastava 2021; Zhao et al. 2021
	Frontal warehouse food e-commence business model	Business activities around the warehouse system, with no or almost no offline sales outlets	
New Retail	Traditional supermarket business model	Completely own both online and offline sales channels, with equal importance	Wen 2018; Luo 2018
	New retail food e-commence business model	Offline channels focus on interacting with customers, attracting traffic to online channels and increasing loyal customers	
Platform-based	Multi-vendor marketplace food e-commence business model	Based on the platform, connecting the demand and supply of food	Chen and Li 2016; Fang and Yang 2017
	Shopping food e-commence business model	There is no fixed cost, and there is no need to consider the rate of product attrition and inventory, and it has advantages over other models in cost control	
Community Group Buying	Community group buying food e-commence business model	In the pre-sale model, the customer's demand orders are collected first, and then centralized procurement and distribution are carried out.	Li and Sun 2020
		Usually, the delivery arrives the next day after the order is placed.	

2.2.2. The selected measures of sustainability

In the previous section, the literature and studies mentioned above propose many different performance metrics for the three dimensions of TBL. Based on the

frequency of these metrics (academic recognition) and the ranking of the importance of these metrics by experts or managers in the food industry in some literature, some metrics that are persuasive for measuring the sustainability performance of food e-commerce have been selected.

The metrics are - Product quality, cost, tech capability, profit, operation time, loss of material for economic dimension; Employee interest and right, health and safety, local community influence, stakeholder influence for social dimension; green standard, pollution production and control, material/resource used, eco-design for environmental dimension.

After obtaining these metrics, those used to measure the sustainability of the production process were removed, considering that the business model studied in this thesis would not involve much of the production process. For Example, technology capability, operation time, green standard, eco-design, pollution production excluding air emissions, wastewater and solid waste, material/resource used in addition to package material used, etc.

Finally, some indicators were adjusted according to the characteristics of the research object, i.e., food e-commerce, and the ease of data collection. Indicators with related content or similar definitions were combined to form broad categories. Health and safety, an indicator describing the health effects of products on consumers, and Product quality, an indicator describing the quality of products, were combined into food safety, which is used to describe whether the food products provided by food e-commerce are safe and reliable for consumers.

The connotations and definitions of some indicators have been expanded. The indicator of local community influence, which describes the impact and contribution of the company to the local community, is expanded to social welfare, which describes the impact and contribution to the welfare of the whole society. The indicator of loss of material, which describes the use and waste of raw materials in the production process, was expanded to Food waste, which describes the waste that occurs during the transportation and consumption of food.

The final metrics and definitions decided upon in this thesis are shown in the following table.

Table 4: Selected sustainability metrics and definitions

	Matric	**Definition and reference**
Economic	Cost	All the costs related to the company's operational and supportive activities.

	Profitability	The degree to which a business or activity yields profit or financial gain.
	Food wasty	Food wasty is defined as losses during agricultural production, harvesting, transport, storage and processing activities, distribution, retail and consumption stages (Bellemare et al. 2017; Schneider 2013).
Social	food safety	Food safety considers the risks associated with acute ingestion, including microbial and chemical contamination that can lead to immediate health consequences, such as foodborne illness or food poisoning (Leib and Pollans 2019).
	Social welfare	Social welfare covers a wide range of services, not just for the needy and disadvantaged. From helping the poor, to caring for the mentally handicapped, to supporting the elderly, and finally to ordinary people (Macarov 1995).
	Labor rights	Labor rights are both legal rights and human rights related to the labor relationship between workers and employers. These rights are codified in national and international labor and employment laws (Organisation for Economic Co-operation and Development 1996).
	Contractual stakeholder's influence	Contractual stakeholder's influence represents the impact of corporate actions on those individuals and groups upon which the enterprise depends for its development in legal terms and for the exchange of resources (Clarke 1998; 6. Esposito et al. 2021).
Environmental	Air emission	Anthropogenic-origin air emissions caused by industrial activities and the burning of fossil fuels (Ahmad and Wong 2019).
	Package Material used	Packaging Material means any material, container or wrapping, used for or in connection with the transport, handling, protection, marketing or sale of any supplies (Paine and Paine 2012).

2.2.3. The selected framework for business models

The thesis adopts the Business Model Framework as a reference when discussing the food e-commerce business models. The Business Model Framework is a value-based model. With Value proposition as the core, the business model is defined and

described in detail by discussing Value Delivery, Value Capture, Value Creation and Value Communication (Abdelkafi et al., 2013 pp.1-41).

Value proposition refers to products or services provided by a company that can create value for a certain customer group. It is the soul of an enterprise. The company uses these products or services to meet customers' needs and solve their problems (Abdelkafi et al., 2013 pp.1-41).

Value Delivery is described by the object of a value proposition and how it is allocated. It defines the way companies interact with customers to provide a value proposition (Bieger and Reinhold 2011). Customer segments and relationships, as well as Distribution Channels, are the two elements included in Value Delivery, explaining to whom and how the value is delivered. Customer segments are the target customer groups that the company focuses on. Enterprises classify target customers according to certain standards, analyze the demand characteristics of different types of customers, and provide them with different products or services. Customer relationship is the establishment and maintenance of certain relationships between enterprises and target customer groups to achieve business goals (Lan 2021). The normal operation of a business requires effective customer segmentation. Establishing an effective relationship between the enterprise and the target customer group will help to improve the loyalty of the target customers. Distribution Channel refers to the entire channel where products or services pass through various intermediaries and flow from manufacturers to final consumers (users). The distribution channel is about getting the product transported in the right quantity, at the right time, and in the right place. It is a strategic system whose mission is to complete the transfer of products and to increase the value of the products (Liao 2021).

Value creation is the result of resource transformation. Resources are tangible (eg production facilities, materials, money, etc.) and intangible (eg knowledge, reputation, etc.) commodities that can be transformed into products or services (Abdelkafi 2012). Key resources and processes describe how this transformation occurs and key partnerships point out with whom companies make this transformation possible. The key resource refers to the strong reliance that helps the enterprise gain market share and defeats the competitors to stand out. It can be leading technical capabilities, or extensive customer resources, or even mature and effective marketing channels. This is the guarantee for the high-speed and effective operation of the business model of the enterprise, and it is also the key point for the enterprise to be invincible in the market competition (Liao 2021). The key processes are the foundation of a company's value proposition and are the main activities a company must undertake in order to ensure sustainable development. The key

processes of an enterprise contain many contents and are also affected by many factors. For example, the company's value proposition, channel access, and customer relationships, etc. Key partnerships mainly refer to the strategic partnership formed by an enterprise with relevant suppliers or partners in the process of operation and development (Lan 2021). By building cooperative relationships, a win-win goal can be achieved: such as optimizing business models, reducing business risks, acquiring resources from each other, etc.

Value capture describes how a value proposition is transformed into a revenue stream and then captured as profit. Value capture depends on the cost structure and the revenue stream. The difference between the revenue stream and the cost represents the profit of the business. The revenue streams refer to the incomes created by enterprises in various ways through business or investment activities, with their own resources and capabilities. The revenue streams of an enterprise will be affected by the products or services sold by the enterprise and will be different in different stages of an enterprise (Lan 2021). Cost structure refers to the costs that a company has to pay to operate. Costs include "direct and indirect costs, allowing for economies of scale" (Abdelkafi, 2012 pp.297-316). Costs exist everywhere, whether it's creating value, building channels, or maintaining customer relationships. A good cost structure is what enterprises need to pursue in the operation.

Value communication ensures that the value proposition is delivered as a message to target groups, such as customers, investors, etc., through different channels. Since different target groups require different messages, the value proposition must be communicated through an understandable, compelling, and coherent story. Thus, channels for communication and Story for value communication are two important components of Value communication (Abdelkafi et al. 2013). Channels for communicating value are the different mediums of communication between a company and its target customer groups, including traditional media such as press advertising, but also new marketing channels such as social media. Story for communicating value means that companies communicate their value proposition in a way that is appealing to consumers through different stories and company images, depending on the content and audience of the message.

2.2.4. Research framework

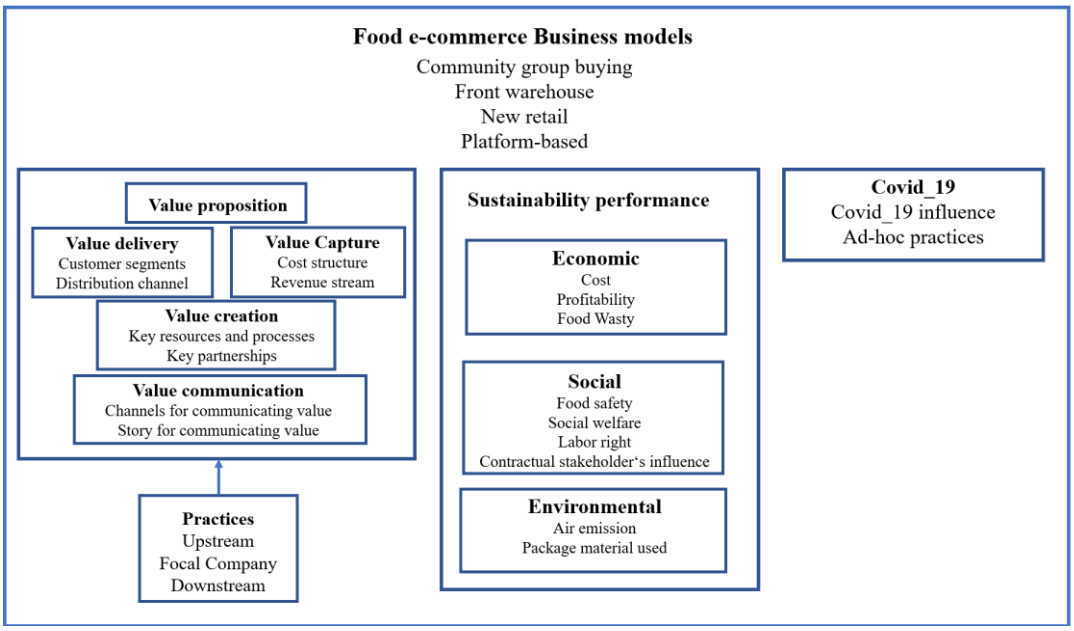


Figure 1: Research framework

The thesis focuses on and investigates the four dominant food e-commerce business models in the Chinese market that were summarized in the previous section. Information was obtained through interviews. Within each model, the thesis describes the business model, practices, sustainability performance, and the impact of the COVID-19.

This thesis starts with the Business Model Framework as a theoretical framework to analyze the business model of food e-commerce with five business elements: value proposition, value delivery, value capture, value creation, and value communication. Second, the thesis talks about the practices involved in a company's operations that are classified as upstream, focal company, and downstream based on the influenced units in the supply chain. When a company's actions and purposes have an impact on upstream suppliers or upstream supply chains, these practices are considered upstream. When a company acts to advance its own interests or enhance its image, these practices are classified as focal company. When a practice markets, distributes and promotes to customers, it is classified as downstream. After the classification, the thesis describes in detail what each practice entails and how it affects the business model. Another research focus of the thesis is the sustainability performance of food e-commerce. Using the triple bottom line as a theoretical framework, the thesis divides sustainability performance into three dimensions- economic, social and environmental- and nine metrics. A detailed description of each metric's performance is provided. Finally, the thesis explores the

impact of the COVID-19 on food e-commerce companies and the ad-hoc initiatives companies have taken to address these impacts.

3. Methodology

3.1. Case study methodology

This thesis uses case study approach to explore and address the research questions posed. Case studies are a research method used to develop an in-depth, multifaceted understanding of complex real-life issues. It is a well-established research design that is widely applied in a variety of disciplines. Stake defines case study as both the process of learning about the case and the product of our learning (Stake 1995). Yin argues that case studies can be used to explain, describe or explore events or phenomena in the everyday context in which they occur. There is no doubt that case study research is one of the most powerful methods used by researchers to realize both practical and qualitative research. Help to understand and explain the reasons underlying the initiatives taken by companies and their impact on the sustainable performance of companies. In contrast to experimental designs that attempt to test specific hypotheses by deliberately manipulating the environment, the case study approach is well suited to obtaining more explanatory "how", "what" and "why" questions. The method is particularly well suited to answering the four research questions mentioned in this thesis. Case studies can be conducted in different ways depending on the epistemological position of the researcher, i.e., whether they take a critical (questioning their own and others' assumptions), interpretive (trying to understand individual and shared social meanings) or positivist approach (oriented towards the criteria of the natural sciences, e.g., focusing on universal considerations). While this model may be conceptually helpful, it may be appropriate to adopt more than one approach in any case study. Doolin notes that in the context of conducting interpretive case studies. Specifically, researchers can effectively use a critical, reflexive perspective in an attempt to take into account the wider social and political context that shaped the case.

This thesis adopts a multi-case study approach, which consists of two phases of analysis: within-case analysis and cross-case analysis. The within-case analysis is an in-depth exploration of individual cases as stand-alone entities, where each company (business model) is analyzed as a whole and the characteristics of the business model, the company-specific policy initiatives and their impact on the company's model and sustainable performance, and the targeted measures taken during the epidemic are explored in depth. After collating and summarizing each individual case, a cross-case approach will be used to compare each company

(business model), exploring in depth and comparing the strengths and weaknesses of each model and its performance in terms of sustainability.

While case studies can provide the researcher with a systematic perspective, they can also build a deeper and more thorough understanding. However, there are also limitations as a case study methodology. In general, the limitations of case studies typically include the following.

1. Difficulty in generalizing findings: case studies should be considered to be generalized not statistically but analytically, which necessarily makes generalization somewhat arbitrary and subjective.

2. Technical limitations and researcher bias: there is no standardized method of data analysis for case studies, the presentation of evidence and interpretation of data is optional, and disagreements among researchers and other researcher biases can affect the results of data analysis.

3. Substantial time and labor costs: Labor-intensive and time-consuming case studies are a very real problem.

3.2. Units of analysis and Case study selection

The unit of analysis in this study is four different business models within the food e-commerce industry, with the unit of observation being the individual companies in the different models. The choice of business models as the unit of analysis is based on the research questions and research directions considered in this thesis. Business models are considered to be an important learning element of the study, and the commonalities of the overall business models are analyzed by summarizing the data from individual or multiple companies to help study and understand the characteristics of the different business models of food e-commerce as well as to make suggestions for improvement.

The logic in case studies involves theoretical sampling in which the goal is to choose cases that are likely to replicate or extend the emergence theory or to fill theoretical categories and provide examples for polar types (Eisenhardt, 1989). The selection of cases is purposeful, not random (Perry, 1998). Other researchers support this method of case selection and highlight the inappropriateness of random sampling. For example, Eisenhardt (1989) states that random selection of cases is neither necessary nor even preferable. Representativeness is not the criteria for case selection, rather the guarded choice of each case should be made such that it either predicts similar results for predictable reasons (i.e., literal replication) or produces contrary results for predictable reasons (i.e., theoretical replication) (Perry, 1998).

The research cases for inclusion in the thesis were first summarized and listed through sources such as company websites, literature, and consultancy reports on food e-commerce companies in China. After the search phase, only eligible companies were selected for case study analysis. The criteria for the study included the following main criteria.

1. Food e-commerce business company that is still operating in China and has regional influence.

2. The company has the same or similar business model to the four business models studied in this thesis.

The companies of fours food e-commerce business models are listed in the following table

Table 5: Research cases summarized

Business model	Company	Found date	Location
	DuoDuo Maicai	2020	Shanghai
	Chengxin Youxuan	2020	Chengdu

Community group buying	Shixing Fresh	2009	Suzhou
	Xingsheng Youxuan	2017	Changsha
	Nice Tuan	2018	Beijing
	Niwonin	2016	Shenzhen
Platform-based	Meituan	2010	Beijing
	Ele.me	2018	Shanghai
	SF best	2012	Beijing
	Tmall Fresh	2011	Hangzhou
	JD Fresh	2015	Beijing
	Daojia	2010	Beijing
Frontal warehouse	Daily fresh	2014	Beijing
	Dingdong(cayman)	2014	Shanghai
	Pu Pu	2016	Fuzhou
	Meituan Maicai	2019	Beijing
	Onemeter fresh	2014	Beijing
	Benlai	2012	Beijing
	Fruitday	2009	Shanghai
	Yiguo	2005	Shanghai
	Fresheasy	2015	Shanghai
New retail	Freshfresh	2013	Shanghai
	Hema Fresh	2015	Shanghai
	Yonghui	2001	Fuzhou
	RT-Mart	1997	Taiwan
	7Fresh	2018	Beijing
	Vanguard	1984	Hongkong
	Lianhua supermarket	1991	Shanghai
	Fat Donglai	1995	Xuchang
	Suning	1990	Nanjing
	Renrenle	1996	Shenzhen
	Jiajiayue	1981	Weihai

In the second stage, the selected companies were contacted individually. Due to the specificity and breadth of the research question, the target occupations were at least middle management, and the channels of contact were: friends' referrals, job boards, LinkedIn, company websites, Weibo, etc. The contact details included messages, phone calls and emails.

The final selection of the final interviewees for this study was made and the requirements and protocols for the interview were explained to the interviewees.

Table 6: Companies basic information

Business model	**Company**	**Date of Fundation**	**Number of employees**	**Head quarter**	**Renenue in 2021(billion yuan)**
Community grouping buying	Shixing Fresh	2009/9/16	69,000	Suzhou	54.3
Platform-based	Meituan	2011/5/6	100,000	Beijing	179.1
Front warehouse	Dingdong	2018/5/10	60,000	Shanghai	20.2
New Retail	Yonghui	2001/4/13	70,000	Fuzhou	91.1

3.3. Data collection

The data for this study was mainly through semi-structured interviews with the final screened companies (individuals), by first preparing a list of identical questions for all respondents to answer for the four research questions, and then asking different questions during the interviews based on the respondents' answers, in order to clarify and further expand on certain questions or answers.

Table 7: Interview information and other resources

Company	**Interviewees 'job**	**Interview channel**	**Date**	**Duration**	**Other sources**
Shixing Fresh (*Community group buying*)	Director of External Affairs Liaison Office	Online audio interview	2022/6/8	60min	Company website Public interviews Periodicals
Meituan (*Platform-based*)	Management Trainee	Online audio interview	2022/8/7	36min	Annual Report Company website Social responsibility Report Periodicals
Dingdong (*Frontal warehouse*)	Distribution Station Manager	Online message	2022/8/4	-	Company website Public interviews Research Report Periodicals
Yonghui (*New retail*)	Director of Jiangsu District	Online audio interview	2022/8/3	68min	Public interviews Company website Social responsibility Report Periodicals

3.4. Data analysis

After completing the interviews and literature data collection for each business model, the interviews first needed to be reorganized by removing irrelevant inflections and organizing the interviews logically. This was because the interviewees were Chinese and there were colloquialisms and logical incompleteness in each interview. Subsequently, due to the poor response of each interview, each interview had to be examined, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study and a standard set of tags needed to be created and the interview content coded so that the relevant content of the interviewer's responses could be easily retrieved later and compared in the subsequent cross-case analysis.

4. Result and discussion

4.1. Within-case study

4.1.1. Shixing Fresh *(Community group buying)*

4.1.1.1. Company profile

Shixing Fresh was founded in October 2012 and is headquartered in Suzhou. Shixing Fresh Online pioneered the operation model of "reservation system + whole-process cold chain + smart freezer self-pickup" to achieve zero fresh food inventory. The company accelerated the integration of online and offline, and deployed brand fresh food chain stores, reusing the fresh food supply chain and background management system. Through direct sales and franchising, Shixing Fresh has built a fresh produce supermarket in the community that "can buy assured food without picking".

In the last 7 years of deep cultivation in the Yangtze River Delta, relying on an efficient operation model and a complete supply chain system, Shixing Fresh has brought fresh, abundant, affordable and safe fresh ingredients to more consumers. The online fresh food business of Shixing has successfully settled in more than 4,000 community sites in three cities, Suzhou, Shanghai and Wuxi, providing fresh food delivery services to more than 3 million households.

4.1.1.2. Business model description

Table 8: Shixing Fresh *(Community group buying)* business model dimensions summary

Business Model Dimension	**Description of the case**
Value Proposition	High quality + low price + convenient life, changing the purchasing habits and lifestyle of users
Value Delivery	Customer segments: 30-45 years old women, high-net-worth household users in first- and second-tier cities Distribution channels: No direct offline stores + refrigerated self-delivery cabinets, Centralized procurement + independent logistics, Three levels supply chain system, T+1 distribution

Value Capture	Cost structure: Initial investment costs, Purchasing and production costs, Logistics and supply chain costs, R&D costs, Operation and management costs Revenue stream: Mainly from online product sales
Value Creation	Key partnerships: Upstream suppliers, universities and other companies Key processes and resources: pre-order model, self-pickup; high-density self-pickup point layout
Value Communication	Word-of-mouth marketing

Value proposition

Shixing Fresh takes "high quality + low price + excellent service + on-time delivery" as its service core and provides the community with selected commodities for daily life such as fruits and vegetables, meat, grain, oil, rice, and noodles. In the future, daily consumer goods will be gradually added. Shixing Fresh establishes a stable and new normal daily purchasing model for community families by changing the purchasing habits and lifestyles of users.

Value delivery

Customer segments and relationships:

Shixing Fresh currently covers 4,000+ communities, mainly in first- and second-tier cities such as Suzhou, Wuxi, and Shanghai. The customer group is mainly concentrated in the age range of 30 to 45, "mainly high-net-worth household users". "Women are the majority of our customers. The number of male consumers is significantly lower than that of female consumers". As a result of the general task allocation of household affairs in China, women are more likely to make household consumption choices and to be in charge of cooking-related matters (Zeng and Zhang 2022).

Distribution channels:

"The users of Shixing Fresh can place an order through the WeChat applet or the company's APP between 0:00 and 23:00 every day and then go to the self-pickup point to get the products by themselves the next day".

Shixing Fresh collects customer orders in the same geographical area and then conducts centralized procurement near the region or in the whole country according to the type of commodities. Shixing Fresh carries out transportation and distribution itself, while apply the supply chain system of 'regional distribution center (shared distribution center)-city distribution center (allocation distribution

center)- service station (self-pickup point)'. This sales model and supply chain system result in the goods arriving at the self-pickup point the next day, i.e., T+1 delivery.

Shixing Fresh does not set up offline sales stores but adopts the method of online sales+offline self-pickup. Shixing Fresh will set up refrigerated self-pickup cabinets in communities, office buildings, subway stations and other areas, and send messages when food arrives to remind customers to pick up the goods. "Shixing Fresh will deliver twice a day, at 6:00 a.m. and 3:00 p.m., so customers can choose to pick up the goods after 9:00 a.m. for lunch or 4:00 p.m. for dinner. "

Value capture

Cost structure:

The cost of Shixing Fresh mainly comes from initial investment costs that include fixed-cost investments in initial distribution centers and refrigerated self-pickup cabinets building, the procurement cost of direct and indirect purchasing, logistics and supply chain costs, R&D expenses for APP maintenance and processes optimization, and management expenses for salaries and some other supportive activities. Technical costs: warehousing costs (such as product loss), logistics and distribution costs from origin to dining table, brand operation, development, and maintenance of WeChat mini-programs or APPs.

Revenue stream:

"The revenue of Shixing Fresh mainly comes from online product sales. " Directly connected with the origin of food, Shixing Fresh purchases commodities in large quantities, without the participation of third parties and middlemen, and takes advantage of quantity to enhance its bargaining power. In addition, the company obtained the payment in advance through the pre-sale system and established a good cash flow.

Value creation

Key partnerships:

Community group buying companies, including Shixing Fresh, do not produce goods themselves, so companies must maintain a stable supply-demand relationship and review mechanisms with suppliers to ensure stable supply channels and food quality. The quality of the supplier directly determines the quality of the product. As the company's most critical strategic partner, Shixing Fresh's upstream suppliers provide high-quality products for the platform.

In addition to suppliers, some universities and companies have also established partnerships with Shixing Fresh to make progress together.

Key processes and resources:

The key processes of the community group buying model are pre-order and self-pickup. These two processes play a decisive role in the operation and cost of the community group buying model.

All community group buying companies, including Shixing Fresh, adopt the pre-order sales model, which means the company purchases after the sale number arrives. Following receipt of the customer orders within the specified timeframe, Shixing Fresh will collate the quantity and information of all the orders. Then, it will purchase from the upstream suppliers on the basis of the aggregated data. This model results in no inventory in the company's distribution center, and product circulation is very fast. It can greatly reduce inventory and warehouse costs. At the same time, it can also avoid high losses due to the perishability and uncertain demand for fresh food. Through the pre-order sales model, Shixing Fresh reduced the loss rate of fresh products and ensured customer satisfaction.

Last-mile self-pickup logistics make intensive distribution possible, which can effectively optimize distribution costs and logistics costs. Different from other food e-commerce business models that use individual users as the distribution unit, community group buying uses a community as the distribution unit for intensive distribution. Shixing Fresh only needs to deliver the goods to the pick-up cabinets in the customer's community (Zhang 2021). This delivery method avoids last-mile delivery costs, which can account for 30% of the logistics cost (Xiong et al. 2020).

For Shixing Fresh, the key resources are the high-density self-pickup point layout. The high-density self-pickup cabinet layout helps make the intensive and effective distribution even better. In several cities where Shixing Fresh has settled, the company has gradually increased the layout density of self-pickup points to ensure that there is at least one self-pickup cabinet within every 1-2 kilometers, and also ensure that more than 95% of the communities in the city have the self-pickup cabinets. "The delivery drivers of Shixing Fresh can deliver 600-800 packages a day. It takes about 2-3 hours for the driver to finish one day’s delivery task, and the driving route can pass through more than a dozen communities or self-pickup stations. Each station can be finished delivery within 10-20 minutes. " At the same time, it is also convenient for customers to pick up. Customers don’t have to travel far to find the nearest pick-up cabinet, increasing their willingness to buy.

Value communication

Shixing Fresh strives to deliver company value to customers and potential customers in a variety of ways. In addition to some conventional publicity methods, such as Weibo, WeChat public account, live broadcast, news media, and arranging company personnel to conduct offline publicity in the community, word-of-mouth marketing is considered to be the most important value communication method. "Our company's main consideration is to allow customers to experience our APP to the greatest extent possible, to make customers satisfied with our products and services, and to make customers repurchase. Then they will voluntarily advertise to those around them, forming a mode of word-of-mouth transmission." Although it is difficult to be fully controlled by the company, is also a low-cost, high-efficient, and high-effective marketing method. At the same time, this method will not arouse customers' disgust because the advertisement tracks are too obvious or the frequency is too excessive.

4.1.1.3. Practice description and Changes in COVID-19

Upstream

C1-UP1: Purchasing directly at the source, eliminating multi-level wholesalers and distributors along the supply chain

Most of the products on the Shixing Fresh platform are fresh commodities, and the information on the supply and demand sides of these products in the traditional market is highly asymmetric, forming a traditional multi-level distribution supply chain system. Under the amplification of the bullwhip effect, suppliers and sellers face a more significant risk of information mismatch. The circulation costs and information costs in the traditional supply chain are usually transferred to consumers, resulting in an increase in the final price. The community group buying supply chain model represented by Shixing Fresh uses subtraction. The company directly purchases from the producers at the origin of the goods, removes the multi-level wholesalers and distributors in the supply chain, retains only the core logistics links of circulation, and establishes a supply chain system of origin-platform company-consumer (Shi 2021). Rapid transportation is achieved by removing intermediate steps. At the same time, it also greatly reduces the inventory at each node. This is conducive to keeping products fresh, saving warehouse rental costs, logistics costs, and costs caused by food spoilage during transportation. This practice effectively reduces costs and influences the cost structure. It also changes the traditional supply chain approach and procurement processes, impacting the key processes.

C1-UP2: Establish a quality and safety traceability system for fresh agricultural products

As a result of quality and traceability issues, community group buying companies like Shixing Fresh are uniquely positioned to track fresh agricultural products considering quality and safety issues from the source because they are directly connected to the producers in the field. "Shixing Fresh has strictly controlled its suppliers and has strict qualification requirements and acceptance standards for suppliers. " Based on government documents and laws, Shixing Fresh requires suppliers to provide basic qualification documents and proof of meeting Shixing Fresh procurement requirements. "Shixing Fresh has also built a complete food traceability system. "From the input of raw material information such as seeds and fertilizers to standardized operations such as picking, cleaning, sorting, packaging, scanning, information input, and collection, this system ensures that "the goods can be traced to raw material suppliers, planting and picking numbers, production and processing machines, serial numbers and workers, loading and unloading personnel, warehouse and management personnel, transportation vehicles and drivers throughout the process." Each circulation link in the system is traceable. Ensuring food quality through the company's food quality and safety traceability system is a key process in the company's operations, and this system is also a key resource for the company.

C1-UP3: Cooperation with villages where products are produced

Shixing Fresh responds to the government exhortation to cooperate with the villages where fresh produce originates. The company "provides standardized planting knowledge and sales and marketing channels for scattered vegetable vendors and helps to drive the industrialization and intelligent development of agriculture, which plays an active role in realizing rural revitalization and precision poverty alleviation." In the first place, Shixing Fresh uses its stable and large order quantity to unite small and scattered local fresh produce suppliers for an organized, collective supply base. This supply base's operation system can boost standardization, economization, and large-scale production. At the same time, a unified quality and safety standard can be established and improved (Shang 2021). Secondly, Shixing Fresh takes advantage of its technical ability to promote the combination of digital technology, AI intelligent technology, and traditional agriculture. Through big data analysis, "the company can provide more accurate demand forecasts of agricultural product types, quantities, and specifications to upstream suppliers." By doing this, Shixing Fresh provides scientific guidance for planting and helps to reduce food waste and farmers' losses caused by unsellable products at the source. Big data can also play a role in analyzing and adapting to the local conditions in terms of soil, climate, and rainfall in different regions. "This will enable us to develop special agricultural product bases. " This practice has helped upstream suppliers from all angles to build better and healthier key

partnerships. At the same time, the practice of helping the poor and the farmers also builds a good social image for the community group buying company and influences the story for communicating value.

Focal Company

C1-FC1: Set up a variety of logistics and distribution solutions

In the initial stage of the operation of the Shixing Fresh platform, the main commodities sold by the company are mainly fresh food. In view of the characteristics of fresh food with short shelf life, perishability, and large demand changes, Shixing Fresh's supply chain is centered on cold chain transportation and a responsive supply chain, which can quickly respond to customer needs while ensuring the freshness of food. But at the same time, the cost of this kind of supply chain is rather high. When the company reaches late stages of development, in order to meet the increasing demand of customers for convenient online shopping and increase customer satisfaction and retention rates, Shixing Fresh will add daily necessities to the available categories, such as rice, flour, grain, and oil that can be stored easily. The demand for these commodities is relatively stable and has a long shelf life and does not require the previously mentioned high-cost responsive supply chain. Its needs can be met by a physically efficient supply chain at a relatively low cost. So, based on the characteristics of the distributed goods, Shixing Fresh has established and implemented different types of supply chains, which can reduce costs and increase profits (Ouyang and Yuan 2016). This practice helps the company optimize distribution channels and cost structure by differentiating the supply chain.

C1-FC2: Electric Logistics Vehicle

Community group buying is closely related to clean energy logistics vehicles. Most of the logistics and distribution of community group buying from distribution centers to self-pickup points belong to urban distribution. Because of the current battery capacity, mileage and distribution of charging stations, urban distribution is the main market for electric logistics vehicles. Shixing Fresh is now gradually replacing the original traditional energy logistics vehicles with electric energy logistics vehicles. "It is estimated that more than 500 new electric logistics vehicles will be added every year". This is due to the strong support of national policies. Many city governments subsidies for the purchase of electric vehicles and tax exemptions for companies that use electric vehicles for distribution. At the same time, the governments have facilitated the passage of electric energy logistics vehicles engaged in urban distribution, simplifying the route planning of logistics distribution. This practice responds to the national policy of energy saving and

emission reduction subsidies, reduces the cost of enterprises, and affects the cost structure.

C1-FC3: The whole-process cold chain logistic and intelligent freezer

Shixing Fresh uses the whole process of cold chain transportation (refrigerated distribution centers, cold chain transport vehicles, and refrigerated self-pickup cabinets) to ensure that the loss of dishes is reduced, the whole process is guaranteed to be efficient and fast, and the time for fresh food to travel from the vegetable field to the table is reduced. At the same time, the refrigerated self-lifting cabinet is not open 24 hours a day, and Shixing Fresh has designed the refrigerator to save energy and reduce emissions. The company's intelligent system will calculate based on the driving information of the delivery vehicle. It will automatically turn on the power of the freezer before the first delivery in the morning. It will then turn off the power supply in the evening after all customers have finished picking up the goods. These practices can effectively reduce a company's wastage costs and energy costs and improve its cost structure.

C1-FC4: Good staff attraction and training mechanism and a company culture full of love and care for employees

"Shixing Fresh pays much attention to attracting and cultivating talents, and it is very beneficial to the development and growth of employees in terms of promotion incentive policies and company culture." First of all, in terms of skill development and career planning, the company has a retail college, which is equivalent to a university in an enterprise. All talents can obtain relevant vocational training and skills training in this college. At the same time, the company has two promotion opportunities every year. Promotion channels allow employees to develop in the direction of the management or professional development. Secondly, the entire enterprise's talent training and enterprise management systems are very standardized and transparent, and any systems and announcements will be disclosed to employees in a timely manner. The third point is the culture of the entire company, which creates a family culture. "We hope that every employee feels at home at the company so that there are no subordinates. Everyone calls each other by their nicknames." In addition, Shixing Fresh cares about the physical and mental health of employees. It has set up a lot of mother and baby rooms, leisure rooms, gymnasiums, and chat rooms for our employees to relax. These practices reflect the importance that the company places on its employees and the formation of company culture and are key processes for the company.

C1-FC5: Collaboration with schools and other companies to optimize company operations

Shixing Fresh is fully aware that "in the highly competitive food e-commerce market, it is difficult for a company alone to become an industry leader." Therefore, Shixing Fresh actively cooperates with research institutions such as the Academy of Agricultural Sciences of universities to provide them with realistic operational data and information. At the same time, Shixing Fresh uses the expertise of these academic institutions and the big data system that collects information from other industries to optimize its own company's operational capabilities and decision-making capabilities. Shixing Fresh also actively cooperates with other food e-commerce companies, learns from each other in supply chain, business model, and other aspects, and improves its own operation level. This practice helps community group buying companies to effectively optimize their operating costs and influence their cost structure. It also creates more key partnerships for the company.

C1-FC6: The intelligent logistics system

For the community group buying companies, logistics and transportation play an instrumental role. In addition to having a great impact on the cost, it also has a non-negligible impact on the order-fulfill ability and service level of the community group buying company. In order to carry out better logistics management, Shixing Fresh introduced and established an intelligent logistics information system. The intelligent logistics system is based on IoT technology, with the cloud platform serving as the structure. It takes full use of the company database, to achieve information sharing and resource integration. "The processes such as order information processing, distribution path optimization, transportation rationalization, accurate sorting, resource integration, cost control, etc. are under the control of this information system". The intelligent logistics information system collects transportation information to optimize transportation routes and coordinate vehicle scheduling. The company can achieve a lower no-load rate and avoid convective or roundabout traffic, thereby reducing carbon dioxide emissions and easing urban traffic pressure. Also, this information system can optimize the management of a series of activities such as collection, packaging, sorting, tracking, and inquiry to avoid waste of resources. This improves economic efficiency as well as low-carbon logistics and shapes social and environmental benefits (Chen 2021). In addition, the intelligent logistics information system can use automatic identification technology such as RFID to trace the entire process of the food supply chain to the source. By making the entire process informative and transparent, food safety problems and their impact have been effectively reduced. The intelligent logistics information system optimizes the company's operations in several aspects and is a key resource for community group buying companies.

C1-FC7: Organic produce sales

Organic vegetables are sold and recommended on the Shixing Fresh platform. "Just open the app and search for organic vegetables, and customers will see the variety they are looking for". This practice has expanded customer segments and revenue streams, as well as established a good corporate social image and impact story for communicating value.

C1-FC8: Reusable plastic bags

The outer plastic bags used to package and transport fresh food are also carefully designed. By analyzing the market data of trash cans, "the designed packaging bag can fit the size of kitchen waste trash cans of most households in China". This practice has created a good corporate social image and impact story for communicating value.

C1-FC9: Public welfare activities in different aspects

Shixing Fresh is fully aware of and strives to fulfill its social responsibilities in the development process. In addition to regularly holding regular public welfare activities such as helping the elderly and caring for the young, Shixing Fresh also pays attention to the employment issues of vulnerable groups such as housewives and the disabled. Shixing Fresh will recruit them as community leaders to support the operations in the communities and provide them with systematic training so that they can master some digital skills. Moreover, Shixing Fresh donated food and daily necessities to the elderly who did not know how to use mobile phone software during the lockdown period. It also used all human and material resources to ensure the food supply in the blocked cities. These practices have established a credible corporate image for the company image and impact story for communicating value.

C1-FC10: Deep cultivation strategy to steadily development

Unlike many companies that are eager to expand community group buying, Shixing Fresh has adopted a steady strategy in terms of business development. After starting business and operations in a city, Shixing Fresh will take 1-2 years to fully and comprehensively understand the city's market, including surrounding supplier information, customer segmentation, commodity preferences, and specialty seasonal foods. In response to this information, Shixing Fresh will optimize the company's operating system and strategy in the city to make it perfectly suited to the regional market. In addition, Shixing Fresh will also cultivate a complete supply chain and customer service system locally to ensure that the needs of local customers can be met and problems can be solved in a timely manner, so as to cultivate a stable customer base. Since then, Shixing Fresh will go to the next city for business development, not like other community group buying companies, which are spread across the country at the same time and cannot guarantee the quality of

products and services. It is the key process for Shixing Fresh since it helps a lot on the healthy development of the company.

Downstream

C1-DW1: Apply big data and intelligent technology to accurately draw customer portraits

After a period of operation, Shixing Fresh has obtained a large amount of customer big data through customer orders and supplier feedback. This big data is critical to the development of the company itself and its suppliers. Shixing Fresh makes use of big data to further segment its customers. By using Python, the company applies digital and intelligent technologies brought by cloud computing, IoT, and artificial intelligence, and combines big data, AI and other technical means to deeply mine and match customer portraits (Lu and Chen 2021), and analyze customer portraits in WeChat groups, including customer analysis, Behavior analysis, time distribution analysis, path analysis, funnel analysis, order analysis, conversion interval analysis, etc. These analyses help to delineate critical marketing metrics such as group preferences, purchasing motivations, and consumption spending ratios to more accurately target each customer in the customer group (Shang 2021). Community group buying platforms can use this data and analysis to establish a list of individual needs. They can also provide assistance to accurately select products to meet the individual needs of consumers such as personal consumption psychology and brand preferences. This practice helps companies to better target their customer segment and to expand and develop channels for communicating value based on different customer segments.

C1-DW2: Design of portions and sizes taking into account the actual amount of customer demand

The different weight specifications of each product on the Shixing Fresh will be adjusted according to the general needs of customers. The company will take into account the needs of single- and multi-population households, and based on big data analysis, the same product will be packaged in different portion and size. "For instance, some fresh products are 250 grams, some are 400 grams, and some are 500 grams". Having a precise weight for the fresh products will help prevent waste. This initiative enables better target at and service customer segmentation. It also reduces the costs of wasting excess dishes when the company does not understand the actual needs of the customer and uniform packaging, improving the cost structure".

Table 9: Shixing Fresh *(Community group buying)* practices summary

ID	Practice
C1-UP1	Purchasing directly at the source, eliminating multi-level wholesalers and distributors along the supply chain
C1-UP2	Establish a quality and safety traceability system for fresh agricultural products
C1-UP3	Cooperation with villages where fresh products are produced
C1-FC1	Set up a variety of logistics and distribution solutions
C1-FC2	Electric Logistics Vehicle
C1-FC3	The whole-process cold chain logistic and intelligent freezer
C1-FC4	Good staff attraction and training mechanism and a company culture full of love and care for employees
C1-FC5	Collaboration with schools and other companies to optimize company operations
C1-FC6	The intelligent logistics system
C1-FC77	Organic produce sales
C1-FC8	Reusable plastic bags
C1-FC9	Public welfare activities in different aspects
C1-FC10	Deep cultivation strategy to steadily development
C1-DW1	Apply big data and intelligent technology to accurately draw customer portraits
C1-DW2	Design of portions and sizes taking into account the actual amount of customer demand

Influence of COVID-19

"During the epidemic, customer demand will fluctuate greatly. Due to the prohibition and blockade of communities or cities, offline channel stockpiling cannot completely guarantee that they will not be exposed to the virus". Therefore, online ordering has become the preferred choice for people. This is both an opportunity and a challenge for companies. The number of orders during the epidemic has grown exponentially and fluctuated greatly, making it difficult to predict based on past data. When demand soars, companies will also face challenges

on the supply side and supply chain. Suppliers' capacity and constraints due to the pandemic have made it difficult for them to ensure that the company's orders can be fulfilled consistently. The company's regular capacity is also struggling to cope with the surge and fluctuating demand. Orders and needs are difficult to meet in time.

Ad-hoc practices

Analyzing the current operation capability:

First, Shixing Fresh's purchasing department will evaluate the company's current supply capacity, that is, whether it can currently meet orders at the peak of customer demand. If it can't be satisfied, the company will increase and stabilize supply capacity by adding new suppliers. Secondly, the distribution department will analyze "whether the company's internal operational capabilities can meet these orders and whether the company needs additional manpower, material resources, and resources to carry out the distribution of peak demand". These are determined according to the needs of customers. The analysis helps the company to understand "to which extent the company has been affected by the epidemic".

Adding flexible suppliers and transportation capacity:

Shixing Fresh has added some flexible supply chain capacities during the pandemic in addition to its original basic setups, such as outsourced personnel, outsourced vehicles, and other optional suppliers, because of the large fluctuations and difficulty in predicting demands during this special period. Once the demand peak or special circumstances arise, the company will quickly adjust the supply chain and rapidly increase production capacity and transportation capacity. This is to cope with possible changes in demand. Basically, the company will make some plans in advance for these two aspects, and then make some specific adjustments according to one of the specific changes.

Table 10: Shixing Fresh *(Community group buying)* in COVID-19

Impact of COVID-19	**Ad-hoc measure taken as reaction**
Demand is volatile	Analyzing the current operation capability Adding flexible suppliers and transportation capacity
The supply side is unstable	

4.1.1.4. Sustainable performance analysis

Economic

Cost

When discussing their performance in terms of cost, the interviewee from Shixing Fresh said, "Compared to other food e-commerce companies, such as Dingdong and Hema Fresh, our community group buying model is certainly very advantageous in terms of cost. "The operation model of community group buying can effectively reduce costs in all aspects. In the procurement process, Shixing Fresh is able to increase bargaining power and effectively reduce procurement prices by aggregating order requirements and centralizing procurement which help to form large procurement volumes. In the transportation and distribution process, Shxing Fresh mentioned in an interview that "high transportation and distribution costs are a huge challenge and problem that many food e-commerce companies need to face". Shixing Fresh has achieved intensive distribution through last-mile self-pickup logistics, which effectively reduces logistics costs. "Each time we deliver a community we can complete several hundred orders. Other food e-commerce business models require their couriers to do multiple deliveries a day. There can only be a few dozen deliveries in one day. When compared to the intensive delivery of hundreds of orders, the time and personnel costs are greatly increased". At the same time, in order to optimize the supply chain configuration and cost more effectively, Shixing Fresh applies different types of supply chains for different kinds of commodities". For perishable foods such as leafy greens, our company is more concerned with refrigerated freshness. For products that have a long shelf life or do not have particularly strict requirements for transportation conditions, the process of transportation is more concerned with cost control". Furthermore, food line fresh makes use of the pre-order model to achieve rapid flow without inventory, thereby reducing storage costs and inventory rental costs throughout the entire supply chain. "This pre-order model of community group buying is the most effective way to reduce product loss costs and storage costs in all food e-commerce business models. "

Profitability

"Our company has been a food e-commerce company for ten years. We started to be profitable in 2019, and now we are consistently profitable. This profitability performance is considered one of the best, not only in the community group buying model but also in the whole food e-commerce industry". According to the answer of Shixing Fresh, they believe that many other food e-commerce companies "is burning money to maintain the operation and in the state of loss", resulting in these companies eventually had to leave the food e-commerce industry. However, Shixing Fresh "is able to optimize its cost structure through a variety of initiatives, and effectively helping the company to achieve profitability". At the same time, the

in-depth cultivation strategy implemented by Shixing Fresh can ensure the company's "stable customer base and cash flow in the cities it has settled in" and realize the revenue increase and profitability.

Food wasty

When describing how the company reduces food waste, the interviewee pointed out that "Shixing Fresh makes full use of the company's business model and related initiatives, which greatly reduces food loss and waste", and specifically answered this question from two aspects.

The first concern is to avoid the loss in transportation. "The average loss rate of agricultural products transportation in China is astonishing, reaching 20-30%. However, the pre-order model of Shixing Fresh can accurately solve the problem of loss of agricultural products, because the company decides the purchase quantity according to the customers' order volume." Shixing Fresh does not need to hold inventory in the whole process of the supply chain, "it can avoid the losses that other food e-commerce companies need to face due to holding inventory". At the same time, Shixing Fresh ensures that the whole process of transportation is effective and fast, and the whole process of fresh food from vegetable field to table can be completed within one day through the whole-process cold chain transportation.

The second is how to avoid waste after the food is sold. "The portion size of our company's products will be planned according to customers' general demand. The precise design of the portion is an important factor to avoid waste during the sale and use of food".

Social

Food safety

"Our company's mission is to provide every family with quality and safe food. In response, we take various methods to ensure the safety of our ingredients. We conduct strict supplier selection and food safety testing in our distribution center. In conjunction with our independently established food traceability system, we realize the food traceability of the entire SC". At the same time, Shixing Fresh has also established a perfect food safety information disclosure system. "Our testing system is networked with the government market supervision bureau. All testing data will be reported to the relevant government departments. Customers are also able to see our ingredient inspection reports in real-time on the app every day." These measures ensure that Shixing Fresh guarantees the safety and quality of food during the whole process to the greatest extent.

Social welfare

In terms of social welfare, Shixing Fresh works from several angles to help the socially vulnerable and those in need. "First, we will have some regular public welfare activities, such as donating goods, and money and helping the elderly. Secondly, we join up with upstream suppliers during the epidemic to provide help to residents and healthcare workers in the blockaded areas." Shixing Fresh believes that the best social welfare actions it has done are precision poverty alleviation and rural revitalization. "Our company has been doing precision poverty alleviation work since 2017. We have been doing the work of helping our counterparts in poverty-stricken areas and promoting the development of agricultural industrialization. We have also established a cold chain transportation center in Guizhou, which has led to the development of other industries in addition to agriculture. This can effectively help the people in these areas to improve their income. These social welfare activities were also awarded as a typical case of poverty alleviation at the national level in the previous two years".

Labor rights

The interviewee of Shixing Fresh said, "our company does a very comprehensive effort in terms of labor rights and interests. In addition to the most basic rights in accordance with national labor laws, some special initiatives are also taken". Shixing Fresh has set up a retail academy to provide vocational skills training for employees, as well as opening up promotion channels to help employees achieve personal development. "The corporate culture is also very friendly to employees. Through an equal relationship, complete with supporting facilities, employees can feel family-like care and warmth". Based on the above practices, community group buying has set a remarkable performance example for other business models in terms of basic guarantees, skills development and company culture and other employee rights.

Contractual stakeholder's influence

"Some of the upstream bases, which are actually developed along with our company, will grow in tandem with us. Our company will go backward to guide farmers and promote healthier development of agriculture". Shixing Fresh provides support through stable and large-scale orders and big data analysis, "helping the upstream suppliers to realize the standardization and large-scale planting of agricultural products, giving farmers and agriculture more scientific guidance and optimization".

Environmental

Air emission

Shixing Fresh "has noteworthy initiatives and achievements on energy saving and emission reduction in many aspects". Shingxing Fresh start to consider air emissions with the cultivation of agricultural products. "We sell buy and recommend organic vegetables on our platform. Organic vegetables do not use chemical fertilizers and pesticides in the production process, and the net greenhouse gas emissions are zero. For every packet of organic vegetables consumers eat, they are helping to achieve national low-carbon goals".

The second part is the distribution process. Shixing Fresh uses intensive distribution for delivery, which can make the most of the vehicle's transportation capability. "While delivering to a certain community each time, we can meet the needs of 500-600 orders, while Dingdong or Hema Fresh can only meet a maximum of 2-4 orders. As a result, other food e-commerce business models are far less capable of planning and optimizing transportation routes than our company, and will consume more energy", with more air emissions. At the same time, Shixing Fresh began to increase the use of electric logistics vehicles in the distribution process, "planning to gradually replace fossil energy logistics vehicles and reduce carbon emissions."

Finally, in the pickup process, Shixing Fresh "made the design of energy-saving for the refrigerated self-pickup cabinets. Instead of being open 24 hours a day, the cabinets will switch power on and off intelligently according to the time when the goods arrive and are taken, reducing energy consumption".

Package material used

When discussing the performance of package material used, the interviewee only mentioned that the plastic bags of Shixing Fresh can be reused as garbage bags and did not mention whether the material is biodegradable and other initiatives to reduce the pollution of plastic packaging.

4.1.2. Meituan (*Platform-based)*

4.1.2.1. Company profile

The problem of environmental pollution caused by unrecyclable plastic packaging is becoming more and more serious, but community group buying companies have not paid much attention to this aspect. Like Shixing, only said that their plastic tapes can be used as garbage bags for the second time and does not mention the degradability of plastic bag materials and other packaging-related measures.

Considering that this practice can actually reduce the use of plastic waste bags, it still has a positive impact on this metric. But the performance is normal.

4.1.2.2. Business description

Table 11: Meituan *(Platform-based)* business model dimension summary

Business Model Dimension	Description of the case
Value Proposition	Retail plus technology & Deliver everything to home
Value Delivery	Customer segments: white-collar workers and school students, spread in all levels of cities in China Distribution channels: Provide a platform to connect and match upstream and downstream needs. Provide distribution services by dedicated and outsourcing couriers.
Value Capture	Cost structure: Delivery costs and Operation costs Revenue stream: Commission from merchants, part of delivery fees paid by consumers, merchant bid ranking fee
Value Creation	Key partnerships: Upstream merchants and logistics outsourcing companies Key processes and resources: Platform operation, Delivery service; The advantage of economies of scale, refinement operation supported by Superin system
Value Communication	Create a good corporate image and community Fewer traditional media channels, more new and social media channels

Value proposition

"The current value proposition of Meituan is retail + technology, as well as delivery everything to home. You can order any item you desire through Meituan".

Meituan, a leading e-commerce platform for life services in China, operates under the strategic model of "Retail + Technology" and works with merchants and partners to offer consumers a quality life, by promoting digital transformation on both the supply and demand sides of commodity and service retailing (Fan 2021). Furthermore, Meituan continues to increase its investment in its retail business, with 'Delivery everything to home' as its core strategy. Meituan has developed urban warehousing and distribution, cold chain logistics and other facilities nationwide to provide more Chinese consumers with 30-minute delivery services for traditional retail goods besides food takeaway (Liu 2019), for example, wine and snacks, fresh fruits and vegetables, flowers and green plants, pets and babies, digital books, etc.

Value delivery

Customer segments and relationships:

Since Meituan is a platform-based company, its customers are the two sides of the platform. One side is the food merchants located in different regions, including small self-operated merchants and branded chain merchants. The other side is food consumers, who are the primary clients of takeaway services. The food consumer base of Meituan is divided into two main types: To Businesses segment and To Customers segment. "To Businesses segment is some enterprises that place large-scale ordering such as company group meals, afternoon tea, etc." The total price and size of each order are large; however, the overall business volume of this segment is relatively small in comparison with Meituan's overall business volume. "To Customers segment is mainly individual users, usually younger urban white-collar workers and school students". In the early period when Meituan was established, it was mostly promoted to college students. Because of the high population density of college students, the high acceptance of new things, and the fast speed of dissemination can help the company quickly open up the market. Nevertheless, college students have limited purchasing power and are more price sensitive, which has impacted enterprise profit margins. To further expand the market, Meituan shifted its focus to white-collar workers (Liu and Ma 2017). The white-collar workers place great value on the quality of catering service with a high consumption level, and a relatively low sensitivity to price. So Meituan launched mid-to-high-end products and services for this group.

In terms of the geographical distribution range, "the customer base of Meituan spans all levels of cities in China, from large cities to small towns."

Distribution Channels:

When discussing the role Meituan in the supply chain, "Upstream of Meituan is the food merchant, and downstream is the consumer. Meituan platform serves as an intermediary between upstream and downstream in the supply chain". The Meituan platform will allow consumers to browse and select their preferred products and merchants. Upon receiving payments from customers, Meituan forwards the orders to merchants and reminds them to prepare the products. Meanwhile, Meituan assigns the task of delivering the order to nearby couriers, who need to pick up the food from the merchants and deliver it to the consumer on time. It is Meituan's responsibility to coordinate the matching of supply and demand, as well as provide courier management for delivery services. Meituan manages "Meituan Dedicated Delivery", a delivery team built by Meituan itself to improve delivery quality, and "Meituan Express Delivery", a crowdsourced delivery team, which is the outsourced idle capacity to solve the lack of capacity during peak hours (Wang 2020).

Value capture

Cost Structure:

Meituan's costs include delivery costs and operating costs. "The most significant cost of the entire Meituan is the delivery cost, the portion of the salary paid to delivery couriers. Our monthly delivery cost is about 2 billion yuan". Operating costs include marketing costs and R&D costs. The marketing costs are mainly for advertising the Meituan platform to attract merchants to move in and consumers to choose Meituan. Investment in R&D is the key to Meituan to stay competitive. In order to maintain efficiency and effectiveness in dispatching and route optimization, it is essential to maintain investment in R&D on the algorithms and the dispatching system of the platform. "Operating costs are an important part of Meituan's costs, but account for far less of the total costs than delivery costs". The previous initiatives to subsidize consumers and merchants on the platform, such as full discounts and commission rebates, Meituan itself did not invest too much money. Therefore, this part of the cost of subsidies is not a major component of the cost structure.

Revenue stream:

The main revenue streams of Meituan are merchant commissions, delivery fees and merchants' bidding rankings. The merchant commission is the main source of profit for the platform and are proportional to sales. There are two types of merchant commissions: "platform delivery commission" and "merchant self-delivery commission". For platform delivery, the commission rate of Meituan is around 20%; for merchant self-delivery, the commission rate is around 5% and 8% (Chen and Liu 2019). At the same time, Meituan will also receive a delivery fee for each order, which is paid by the consumer. The courier receives part of it, and Meituan retains the remaining portion as revenue. Factors that affect the amount of the delivery fee include distance and weather conditions. "Bidding ranking revenue is also a major source of revenue for Meituan". Merchants are required to pay this fee if they wish to rank high in search results.

Value creation

Key partnerships:

For Meituan, it is crucial to maintain a relationship with the food merchants who provide the products upstream. In the first place, the number and quality of merchants are decisive factors that determine the willingness of consumers to use the platform. Consumers will only continue to stay with one takeaway platform if they can find the stores and products they are looking for. Furthermore, Meituan's main source of revenue is the commissions and bidding ranking fees it receives from merchants. As a final point, Meituan's reputation and its merchants enjoy the same

level of prosperity. Consumers can only enjoy the reputation of Meituan if the merchants provide them with safe and high-quality food and services.

On the delivery side, Meituan's operating costs and efficiency are determined by its partnership with outsourced logistics companies. As well as establishing a dedicated delivery team under its own jurisdiction, Meituan recruits third-party logistics companies nationwide and invites their employees to join Meituan's delivery team. As of now, Meituan has connected more than 20 logistics companies to its delivery system, including Jingdong Logistics and Dada Logistics, improving the efficiency of Meituan's delivery services and reducing the cost of its delivery services (Wang 2020).

Additionally, Meituan has formed partnerships with some industry associations, universities, and other research institutions. Through collaboration, they will be able to achieve a win-win situation and will be able to take on more social responsibility and create more social value as a whole.

Key processes and resources:

The Meituan platform is an intermediary between consumers, food merchants and delivery couriers. Customers find information and pay for their orders online and enjoy the products and logistics delivery services offline. Merchants advertise to solicit customers and take orders online, and the actual products are delivered to consumers by delivery couriers offline. Therefore, the key processes of Meituan are 1) building a platform to connect the supply of the food merchants with the demand of consumers, enabling the flow of information, capital, logistics, and business flow. 2) undertaking the function of coordinating logistics and delivery between consumers, merchants and delivery couriers.

"At present, the main advantages of Meituan are the refinement of operations and scale advantages. In comparison to Ele.me, the total cost of same delivery Meituan will be much lower. "

One key resource of Meituan is its 70% market share in the field of takeaway delivery. Due to the high volume of traffic and the number of orders, during delivery in one area, couriers can complete several orders at the same time. This greatly reduces time and delivery costs. In addition, the large number of orders can also assist Meituan in obtaining a large number of user data. Through the use of big data technology, Meituan is able to fully utilize this resource to analyze customer data and provide differentiated customer service based on the characteristics of different customer groups, including personalized advertising, precision marketing, and after-sales support.

The refined operational capability supported by the Superin system is also the key resource of Meituan. The functions of Superin cover many departments and partners within Meituan, including the merchant side, the delivery side and the customer side (Liu 2018). As a result of Superin's heavy reliance on artificial intelligence technology, it optimizes all aspects of Meituan's business operations, including pricing, ETA, scheduling, capacity planning, capacity intervention, subsidies, accounting, voice interaction, LBS mining, business operation and maintenance, and metrics monitoring, based on the core guidance of cost, efficiency, and experience (Xiong and Yan 2022). As a result of the perfect optimization of the Superin system, Meituan is able to achieve a lower cost per order than its competitors, as well as offer customers a superior consumer experience with lower prices and better service, leading to a higher market share and profitability for the company.

Value communication

At the beginning, Meituan platform focused heavily on integrating online and offline marketing strategies. With a combination of offline channels, including regional advertisements and local promotions, as well as online channels, including web ads, video ads, and search engine or browser homepage pushes, Meituan firmly grasped its core connotation of convenience and launched a massive marketing campaign as a result. Through increased exposure and increased visibility, it has attracted a large number of initial users and provided the opportunity for the initial platform to be retained.

Since Meituan has reached the middle stage of its development, there is no longer a need to raise awareness and absorb a large number of new customers. As part of this stage, Meituan mainly utilizes personalized pricing strategies and recommended product strategies based on the attributes of each user, as well as large-scale discounts to enhance customer satisfaction and increase the retention and loyalty of existing customers (Shi and Chu 2019).

At this mature stage of Meituan's development, "because we have a 70% market share, we no longer need much promotional marketing aimed at creating new customers". Meituan is now focusing on developing a positive brand image and community concept through marketing (Yu 2019). "We will now use less traditional media, such as TV commercials since our target group is young. Therefore, Meituan will pay attention to some new media the young people have access to", such as mobile short videos, various social media KOLs, etc. Through public service advertisements, mascot, storytelling and interactive marketing, which are more popular among local young people, the company image of Meituan will be implicitly established among young people.

4.1.2.3. Practice description and Changes in COVID-19

Upstream

C2-UP1: Strict verification of the merchants who are registered on the platform

Meituan has a six-step verification system for food merchants who want to join the platform. Before the merchant is admitted, "Meituan will require the merchant to upload food business license and employee's health certificate" and other valid documents and related qualifications for approval. The license qualification information uploaded by food merchants will be verified and strictly audited before the merchants can successfully enter the site. Upon acceptance, Meituan will also regularly verify the merchant's license qualification, and when it is found that a license is being used for multiple purposes, expired licenses, fake licenses, or over-scope operation, the merchant will be notified to rectify the situation. If the fix cannot be completed on time and in quality, it will be canceled. A third-party professional institution will also be invited by Meituan to inspect the merchant's cooking environment. Meituan will notify the merchant immediately if the standards are not met. If it continues to fail to meet the standards, Meituan will cancel the certification of the merchant (Xu 2018). Due to the nature of the platform-based model, it is a key process to conduct a strict audit of the merchants who are enrolled, which affects the quality of the service. At the same time, this is also the screening of key partnerships by Meituan.

C2-UP2: Public monitoring of food safety

To ensure the level of service quality, Meituan has developed an electronic file system for food merchants operating on the platform, known as the "Skynet System" (Hou 2017). Meituan requires each merchant to be equipped with a standard company-issued camera and puts the video portal to the APP. In this way, customers and government prosecutors are able to view the merchants' kitchens at any time and from anywhere. Meituan invites customers to visit and supervise the food merchants. Meituan and the supervisory department will receive information and feedback about the quality of the restaurants so that the supervisory department can perform dynamic inspections on the merchants accordingly. The Skynet System also collects and analyzes data information such as consumer evaluations, complaints and reports on food safety through the APP and platform and conducts in-depth analysis to form intelligent data reports as a basis for self-inspection of food safety. The Skynet System allows consumers to act as supervisors and comment on the food. This will not only discipline the behavior of the customers but also make the customers feel safe to buy and eat and increase their

satisfaction. Public monitoring of food safety is the key process to ensuring food safety.

C2-UP3: Introduction of commission rate transparency revolution

Meituan is piloting the reform of commission rate transparency in several cities across China. The commission and delivery fee are calculated separately to make the billing method clearer and more transparent. The commission is a fee charged by the platform for the display of information, technical services, traffic support, and operational security services provided to merchants when they operate on the platform and reach transactions. The merchant delivery fee is used to pay for order delivery fees, delivery stations and order capacity dispatching and other operating costs. It is only generated when merchants choose the platform for delivery. This cost varies with time of day, distance and unit price. Merchants will be able to choose the method of delivery more independently (Hu 2020). This practice is a reflection of Meituan's support and assistance to upstream food merchants, effectively improving and influencing key partnerships. In the meanwhile, it also has an impact on Meituan's revenue stream.

C2-UP4: Takeaway butler service for merchants

Meituan launched a takeaway butler service program that provides different levels of assistance and guidance to different groups of merchants. Suppliers are classified by Meituan first. Some large restaurant chains, such as KFC and McDonald's, will be defined as large customers. For large merchants, Meituan will offer advertising space, commissions, docking specialists, and other resources. In order to help small and medium-sized merchants improve their risk resistance and revenue capacity, Meituan provides six online operations services: store decoration, business diagnosis, meal design, activity planning, promotion and marketing, and operation optimization (Hu 2020). Moreover, Meituan continues to provide special subsidies, providing 100,000 free places for small and medium-sized merchants to help them improve their operational capabilities and open online and offline stores. As part of its support and assistance to upstream food merchants, Meituan has improved and influenced key partnerships through this practice.

Focal company

C2-FC1: Green Mountain Project innovative green packaging materials and use

"For businesses, we will encourage them to join a public welfare project called the Green Mountain Project ..... to do some public welfare activities for environmental protection. "By implementing the Green Mountain Project, the amount of waste and pollution associated with takeaway packaging is significantly reduced. Meituan has

actively worked with the Joint Working Group on Green Recycled Plastics Supply Chain to release the "Implementation Rules for Easy Recycling and Renewable Design Evaluation of Plastic Products" to establish an industry standard for food e-commerce. As part of its "Environmental Packaging Innovation Incubation" program, Meituan selects green innovative packaging for merchants and tests them in actual scenarios, collects extensive feedback from merchants and consumers, and continuously optimizes the packaging products. More than 30 million fully biodegradable bags, more than 1.91 million pieces of innovative environmental protection packaging, and 120,000 sets of recyclable tableware and straws (Chen, 2020 pp.17-9) have been placed during the pilot and optimization phases. In addition, Meituan continued to promote the large-scale meal box recycling project in Shanghai and Xiamen with a daily meal box recycling volume of about 3-5 tons (Lin,2017 pp.69-71). This public welfare program follows the general direction of China's green and low-carbon development and can effectively enhance the corporate image of Meituan and influence the story for communicating value.

C2-FC2: Advocate not to use disposable tableware

In the past, when consumers placed orders on the Meituan platform, merchants would automatically provide consumers with disposable tableware based on the portion size of the order. Meituan and merchants will no longer default to consumers using disposable tableware. Before placing an order, "consumers can choose to need tableware and the number of tableware, or they can choose not to use tableware, and if they choose tableware there may be additional charges". The purpose of these practices is to reduce the use of disposable tableware and to protect the environment by setting the amount of tableware needed in response to actual demand. This practice is effectively perceived by consumers when they consume, helping to enhance Meituan's corporate image and influence the story for communicating value.

C2-FC3: Delivery by electric bicycle

The majority of Meituan couriers use electric bikes to make deliveries. This is due to various considerations. First of all, urban traffic is very easy to block. A car can be used to deliver take-out food that requires high timeliness, but it is bound to be delayed by traffic jams during the morning peak and evening peak, resulting in a significant decline in delivery efficiency and customer satisfaction. As opposed to cars, smaller electric bicycles can be ridden more freely through the city, with less need to worry about traffic jams. Secondly, the profit and income per order for couriers is relatively small. If they use cars for delivery similar to Uber Eat, the cost of fuel and vehicle maintenance is a big expense. This expense is unaffordable for many couriers in the lower social classes. This practice is motivated by the speed of

delivery and can reduce the company's time costs, which in turn affects the cost structure.

C2-FC4: Introducing an "anti-waste" culture

Through product design and public welfare advocacy, Meituan works with industry associations and merchants to guide users to order the right amount of food and to reduce food waste. A joint document was drafted and formulated by Meituan and the relevant state departments to prevent food waste caused by unclear portion size and taste information. Furthermore, Meituan launched an initiative to encourage food merchants to provide single-serve meals and small portions to consumers with different dining requirements. A search option for small portions has also been added to Meituan's order page, as well as an alert function that will remind consumers when they recognize that they have ordered a certain number of meals, to ensure that they do not waste those meals. This public service program supports national advocacy while better serving customers, enhancing Meituan's corporate image and impacting the story for communicating value.

C2-FC5: Regular iterations of takeaway boxes

Takeaway, in the past, only solved the problem of getting food from the stove to the table. With the deepening of competition and the continuous improvement of user needs, users' requirements are not only for delivery but also for no-loss delivery. No-loss here, for takeaway means not only that the food has not deteriorated, but also that the taste and flavor of the food have not changed. The delivery box used by couriers will be regularly iterated and updated to ensure that the box can achieve a stable constant temperature within a certain period of time, to ensure that the flavor will not change. The current upgraded version of the intelligent temperature-controlled delivery box has two parts: heating and refrigeration. Carbon fiber heating technology is used in the heating box so that the temperature is maintained at about 55 °C in the center of the box - this is the most suitable temperature for the taste of the dish, and even if many times are used, the temperature will not drop. With the help of ice plate physical refrigeration technology, the lowest temperature can reach -5 °C, ice cream and other food that must be frozen can be stored for about 6 hours in the freezer without melting (Yang and Hu 2019). The intelligent temperature-controlled delivery boxes are a key resource for Meituan Takeaway to improve delivery quality.

C2-FC6: Providing skills development and diverse growth opportunities for couriers

The Meituan Courier App has a training center with more than 120 skills training courses in 8 categories. It offers a newbie introduction, rules and procedures, safety topics, and other learning materials for couriers at different stages of employment.

Couriers are provided professional guidance on work necessities, traffic safety, life guidance, and psychological counseling for their career development (Luo 2020). Meituan launched the station manager development program, and it is expected that nearly a thousand couriers will be promoted to station manager and other management positions every year. The courier transfer program has also successfully transferred more than 100 Meituan couriers to supervisory and trainer positions. At the same time, Meituan has also "joined forces with the National Open University to provide educational assistance to couriers" and launched the Courier Development Incentive Award. Couriers who wish to upgrade their education are provided with a one-time full scholarship for the completion of their studies. For Meituan, training and self-improvement of couriers is a key process that can enhance delivery efficiency and customer satisfaction.

C2-FC7: Caring for the courier's daily life and family situation

During traditional Chinese festivals, Meituan offers customized holiday care gifts to its couriers and pays close attention to the distribution of supplies during the winter and summer months. At the same time, Meituan has linked multiple forces to create a love station. This will enable couriers to rest their feet in adverse weather. The company has set up a medical-care fund to help Meituan couriers and Ele.me couriers and their families under serious-illness conditions. The company has upgraded its "Kangaroo Baby Public Welfare Program" to set up the industry's first Kangaroo Baby Ward School. It offers free companionship education, childcare, and other services, with the intention of gradually expanding to more areas in need as the situation requires. This practice can establish a good corporate image for Meituan and influence the story for communicating value.

C2-FC8: Employment and assistance for people with disabilities

"Meituan will employ some disabled people as couriers". There has been an increase in the number of disabled couriers on Meituan in recent years. They rely on the platform's support and their own efforts in order to receive payment and win the respect of society. Meituan not only provides a job for these special couriers but also restores their enthusiasm for life and work. The greatest contribution a company can make to helping people with disabilities is to empower them at the highest level. Along with employing people with disabilities as couriers, Meituan also assists people with disabilities in opening stores and developing digital businesses. A disabled version of Meituan's merchant application has been launched and is being operated, providing blind merchants with a zero-cost marketing and promotion channel and standardized Internet business training. It helps blind merchants attract online traffic, reduce operating costs and improve store services. This

practice demonstrates Meituan's care for the socially disadvantaged, builds a good corporate image, and influences the story for communicating value.

C2-FC9: Establishing Meituan Public Welfare Ecology

In normal times, Meituan provides a range of services that combine public welfare with daily consumption. Meituan joins hands with users and merchants to do public welfare and drives employees to actively contribute to creating a multi-participation public welfare ecology (Wen 2020). As part of its social responsibility program, the company has been actively involved in building hope schools, optimizing rural school facilities, providing offline services to the elderly, and other areas of public welfare. In the event of a major epidemic or disaster, Meituan mobilized technical capabilities and online and offline resources under the unified deployment of government departments to contribute to the emergency relief and post-disaster reconstruction of epidemics and other unexpected disasters. Meituan donated ambulances to hospitals and civil organizations in various cities during the Covid epidemic, and actively ensured the supply and distribution of livelihood materials. During the Henan floods, Meituan donated emergency supplies and contacted businesses to provide temporary shelters and landing places for citizens (Wen 2020). These practices show Meituan's concern for social welfare, establish a good corporate image and influence the story for communicating value.

C2-FC10: Accelerate the integration of industry, school and research innovation

Relying on rich business scenarios, data resources and real industrial problems, Meituan has conducted more than 100 research cooperation projects with scholars from more than 30 famous universities and research institutions at home and abroad. There are many technical achievements in autonomous driving, machine learning, knowledge mapping, scheduling optimization and other research directions that have been applied in different business scenarios. Furthermore, Meituan is actively working with universities to promote science and technology talent cultivation, as well as restore a real industrial environment and challenging practice scenarios for students so that the knowledge can be put to good use earlier. More than 1,000 students are enrolled in 5 courses offered by Meituan in universities now. This practice reflects Meituan's good social responsibility to help society progress and can help Meituan build a better image and affect the story for communicating value. It can also help Meituan optimize its own key resources through the results.

C2-FC11: Outsourced delivery capability

In Meituan, the largest business is food and beverage, which is highly time-aggregated with a peak in delivery demand during mealtimes. At other times of the

day, there is less demand for delivery. If all of them are delivered by full-time dedicated couriers, the problem of wasted capacity during off-peak hours is bound to arise. At the same time, the demand for takeaway is obviously insufficient in third- and fourth-tier cities when compared with developed first- and second-tier cities, so if all direct deliveries are realized, the cost of delivery manpower will inevitably rise. In light of this, Meituan changed its strategy to transfer part of the delivery service in big cities and all of the capacity demand in small and medium cities to outsourcing logistic companies. These outsourced couriers form the delivery team of Meituan Express Delivery. Distribution cost is the biggest cost expense of Meituan, and this practice directly reduces Meituan's operation cost and also affects Distribution channels.

Downstream

C2-DW1: Attracting traffic through other APPs of the parent company

Through the accumulation of data and the gradual improvement of technical services, other APPS of Meituan's parent company, such as Dangzhong Dianping, can provide a huge traffic entrance for Meituan Takeaway. Customers are naturally attracted to the Meituan takeaway platform for a new round of consumption as a result of the brand effect, which greatly reduces the advertising expenses of Meituan as well as the operational costs. This practice not only reduces Meituan's marketing costs and affects the cost structure, but also adds Channels for communicating value for Meituan.

C2-DW2: Emphasis on privacy protection

Meituan pays great attention to the protection of customer privacy. The platform automatically generates a virtual number for users when they use Meituan's delivery services, and merchants and couriers can only contact the user through this virtual number. In order to maintain the privacy of customer numbers, the virtual number will expire immediately after the service is completed. Meituan also continues to improve the technical level of personal information protection, using more trusted protection mechanisms to prevent malicious attacks on users' data. When it is necessary to share information with third parties, Meituan makes sure to give informed consent to users and properly manage the security of the entire process of data after user authorization. A strict data security management system has also been established at Meituan to ensure that only authorized personnel have access to internal data (Li 2018). Confidentiality of consumer information and privacy is a key process in Meituan's operations. It can also help Meituan build a good corporate image and influence the story for communicating value.

C2-DW3: More attentive after-sales support

Users can provide feedback to Meituan through various channels, such as the customer service hotline and social media channels. The user can protect his or her legitimate rights and interests by using services such as "eat with confidence", "refund at any time", and "extremely fast refund". As a service-oriented company, good after-sales support is a key process for Meituan. At the same time, the company can also establish a good company image through after-sales support and influence the story for communicating value.

Table 12: Meituan (*Platform-based*) practices summary

ID	Practice
C2-UP1	Strict verification of the merchants who are registered on the platform
C2-UP2	Public monitoring of food safety
C2-UP3	Introduction of commission rate transparency revolution
C2-UP4	Takeaway butler service for merchants
C2-FC1	Green Mountain Project innovative green packaging materials and use
C2-FC2	Advocate not to use disposable tableware
C2-FC3	Delivery by electric bicycle
C2-FC4	Introducing an "anti-waste" culture
C2-FC5	Regular iterations of takeaway boxes
C2-FC6	Providing skills development and diverse growth opportunities for couriers
C2-FC7	Caring for the courier's daily life and family situation
C2-FC8	Employment and assistance for people with disabilities
C2-FC9	Establishing Meituan Public Welfare Ecology
C2-FC10	Accelerate the integration of industry, school and research innovation
C2-FC11	Outsourced delivery capability
C2-DW1	Attracting traffic through other APPs of the parent company

C2-DW2	Emphasis on privacy protection
C2-DW3	More attentive after-sales support

Influence of COVID-19

The Covid epidemic has accelerated the change of shopping styles and habits in Chinese society and shaped many distinct types of consumer needs. According to respondents, the impact of the epidemic on Meituan has also been significant, with both positive and negative aspects. First, the regional blockade caused by the epidemic is a huge opportunity for Meituan to expand and develop merchants on the supply side. "Before the epidemic, there were a lot of merchants who were reluctant to open this channel with Meituan since they felt the commission was too high. Later, because of the epidemic and the government's restrictive policies, people were not allowed to dine-in, and then Meituan just gave merchants the opportunity to sell on the channel". So many of the restaurant companies that were not willing to join the platform originally joined Meituan after the epidemic. After the epidemic, the number and quality of food merchants on the supply side of Meituan increased a lot.

However, the same policy has a very negative impact on the delivery side of Meituan, the interviewee said. If a certain area is said to be blocked, all stations will be closed and couriers in that area will be prohibited from making deliveries. Now that the epidemic has reached an advanced stage, government policy has also started to loosen up. Couriers are allowed to deliver in some epidemic areas, but they must do Covid tests every day.

Ad-hoc practices

Support new-coming food merchants:

Faced with a good opportunity to expand the supply side, Meituan has acted proactively to provide convenience and system usage assistance to merchants who want to join the platform, including commission waivers during the epidemic (Li 2020).

Manual and Unmanned delivery combination:

To address the shortage of capacity at the delivery side due to government policies, Meituan strictly complied with regulations and required delivery couriers to conduct daily self-tests to ensure there was no risk of infection after the situation improved and delivery services could be performed. To increase delivery capacity during the epidemic, Meituan accelerated the development of delivery unmanned

vehicles and drones, which was originally underway. This was done to complete delivery through machines and reduce manual delivery. "Meituan is now launching unmanned vehicles and drones. The drones are still on the pilot, but the unmanned vehicles played an important role in the epidemic blockade in both Shenzhen and Shanghai". Shenzhen is the main pilot area for delivery drones, and residents of 8 communities and 1 shopping district in Shenzhen have enjoyed the regular drone delivery service. In some areas where the epidemic was very serious, most of Meituan's orders were delivered via unmanned vehicles. For example, during the epidemic in Shanghai, the unmanned vehicles placed by Meituan greatly improved the efficiency of delivery. By the end of 2021, Meituan's automated delivery vehicles had covered more than 700,000 kilometers and completed nearly 190,000 orders.

Adjustment of assessment systems for outsourced logistics companies:

The interviewee also pointed out that, as previously mentioned, many of Meituan's couriers are employed through outsourced forms of third-party logistics companies. While the epidemic affects Meituan's delivery capacity, it also affects the assessment performance of these outsourced logistics companies within Meituan's system. The performance of outsourced logistics partners will be poor when experiencing epidemic effects and having difficulty completing deliveries. If the evaluation system before the epidemic is followed, then these merchants may face problems such as being dismissed by Meituan. After discovering this problem, Meituan launched a new SOP. If there is an epidemic in a city, Meituan exempted the logistics partners in that area to remove the impact of the epidemic and protect the partners from punishment.

Table 13: Meituan *(Platform-based)* in COVID-19

Impact of COVID-19	**Ad-hoc measure taken as reaction**
supply-side expansion	Support new-coming food merchants
Delivery staff unable to meet delivery demand	Manual and Unmanned delivery combination
	Adjustment of assessment systems for outsourced logistics companies

4.1.2.4. Sustainable performance analysis

Economic

Cost

As the interviewees mentioned in the advantages of the platform-based model, "the asset-light operation model of the platform-based model leads to an inherent advantage in cost compared with other food e-commerce. First, the initial cost of the platform-based model is very low". The essence of the platform-based model is to connect demand and supply by building a platform, which does not require large-scale investment in capital to build fixed assets such as warehouses or stores in the early stage of development. At the same time, "The cost structure is mainly variable cost represented by operation cost and distribution cost, and the fixed cost is relatively small. It is a more ideal cost structure". Considering to effectively reduce delivery costs, which is the main part of the cost structure, "Meituan also outsource part of their capacity needs to logistic service providers".

Profitability

According to the information provided by the interviewees, the Meituan platform has broken even in 2019. According to the group's financial report, Meituan's operating profit in 2021 was 6.174 billion yuan, with an operating profit margin of 6.4% and a year-on-year increase of 117.9%. "Considering its current monopoly position and competitive advantage in the industry, Meituan has the potential and ability to sustain long-term profitability".

Food wasty

"Meituan is responding to the national call to practice frugality and oppose waste. We have a range of initiatives to reduce food waste with good results". Meituan "requires food merchants to consider multiple portions and sizes of meals for consumers with different needs and gives a reminder when consumers order more than a certain number of portions" to avoid waste caused by the inability to accurately estimate the portion size of the meal. "Meituan also ensures that meals do not deteriorate by regularly updating and iterating the intelligent temperature-controlled delivery boxes to ensure a constant temperature in the delivery process".

Social

Food safety

"The food merchants on the platform are not under the direct management of Meituan and Meituan does not have the ownership of food. Therefore, the food safety and quality control are weaker compared with other food e-commerce business models", said the interviewee. Meituan is clearly aware of the existence of this problem and has introduced a series of practices to strengthen management for food safety and quality control. "When merchants are enrolled in the platform, we will conduct strict qualification audits" to ensure that only food merchants that meet

national food safety standards can become suppliers. After the merchants have been enrolled, "we will also require them to live-stream their kitchens" and arrange for consumers and third-party organizations to conduct unannounced visits from time to time, which helps to achieve public scrutiny. With the effective implementation of this series of measures, "the standardization of food merchants and the level of food safety in Meituan have been continuously improved".

Social welfare

Meituan will "organize food merchants, employees and consumers to join Meituan's public welfare platform, together to help some regular public welfare activities". And in some emergency disasters and epidemics, Meituan will do what it can to lend a helping hand and donate much-needed items to the community. Meituan also pays great attention to helping people with disabilities. "We will actively provide them with jobs such as couriers and adaptive support facilities "to help disabled people become self-reliant and self-sufficient. In addition, "if the couriers' children are seriously ill, we will raise funds for them. Not only for the couriers of Meituan but also the couriers of Ele.me can benefit from it". "These are all important contributions that Meituan has made in terms of social welfare. "

Labor right

Meituan cares about the work and life of couriers and hopes to improve their work experience and life well-being. "We continue to introduce a number of rights and interests protection for couriers around delivery experiences, vocational training, and life care, hoping that they can achieve self-development with more peace of mind and happiness".

However, while Meituan uses outsourced messengers for flexible labor to save labor costs, it also transfers costs and burdens such as social security for workers to society. Public information on the Meituan website shows that there are nearly 10 million messengers registered on Meituan platform, of which 4.7 million are part-time status. "These part-time couriers are registered as platform couriers through third-party logistics outsourcing companies, and there is no employment relationship with the takeaway platform". Thus, "the basic legal rights and interests of workers, such as social security and reasonable working hours, are not sufficiently protected for couriers".

Contractual stakeholder's influence

"Meituan classifies upstream food merchants and provides targeted assistance based on their scale and operational capabilities. It has effectively helped all merchants achieve better online and offline operations". Meituan has launched

various support measures to find and solve problems for small stores and helps small stores to grow more and more prosperous. These initiatives include commission transparency reforms. As of 2022, the commission transparency reform has covered 70% of merchants nationwide. "For some new small merchants, we will provide them with public courses and takeaway butler services. These are mainly to teach them how to manage the store and teach them how to do marketing". For some large merchants in franchises, "we take more of a win-win cooperation attitude. Through allocating more resources and policies to them, we establish a more solid partnership".

Environmental

Air emission

In order to protect the earth and respond to the national carbon-neutral development goal, Meituan adheres to the concept of green development of the ecological chain and has achieved fruitful results. "First, the intelligent delivery and dispatching system of Meituan can effectively optimize the delivery path, shorten the delivery mileage and reduce energy consumption. Secondly, most of the delivery is done by electric bicycle, which can effectively reduce the use of fossil energy and reduce carbon emissions". According to the joint report of Meituan and Xi'an Jiaotong University, according to the calculation standard of carbon emission reduction, the air emission reduction of Meituan's electric bicycle distribution is 409,000 tons in one year. The goal of energy saving and emission reduction has been achieved.

Package material used

"Meituan recognizes the impact of plastic packaging on the environment and has developed a special public welfare project, which is called Green Mountain Project". Green Mountain Project has invested heavily in developing and promoting green packaging materials and has piloted the use of recyclable and biodegradable packaging on a large scale. In addition, the project also encourages consumers to reduce the use of disposable tableware through function design, such as self-selecting the number of disposable tableware and charging for disposable tableware.

According to the social responsibility report released by Meituan, Green Mountain Project has achieved remarkable results since its implementation. Since the implementation of the plan in 2017, more than 200 million users have used Meituan's no tableware function, and the proportion of environmental protection orders has increased by nearly 40 times. In the past five years, Meituan has incubated and launched 30 models, 1.91 million green packaging products, and reduced carbon emission by more than 7,000 tons.

4.1.3. Dingdong *(Frontal warehouse)*

4.1.3.1. Company profile

Dingdong (Cayman) is the leading on-demand e-commerce company in China. Founder Changlin Liang started the business in Shanghai in May 2017. Through a convenient and superior shopping experience supported by extensive self-operated first-line fulfillment, Dingdong provides everyday items such as fresh produce, meat and seafood directly to users and families. With fresh groceries as its core product category, Dingdong has successfully expanded to offer other lifestyle essentials, growing into China's leading one-stop online shopping destination for consumers to purchase everyday necessities. Dingdong is also committed to modernizing China's traditional agricultural supply chain through standardization and digitization. This will enable upstream farms and suppliers to make their production more efficient and tailored to actual demand. Dingdong is committed to direct sourcing and providing customers with a high-quality, time-efficient, and diverse fresh food experience through a dense network of Frontal warehouses around communities and technology-driven industry chain upgrades

4.1.3.2. Business description

Table 14: Dingdong *(Frontal warehouse)* business model dimensions summary

Business model dimensions	**Description of the case**
Value proposition	Quality determination, time determination, category determination Meet the cooking needs of residents for three meals a day Cultivate consumers' high frequency purchasing habits
Value delivery	Customer segment: White collar customers within 10 km and layout of China's first-tier cities Distribution channel: Peripheral origin and direct sourcing, distribution through frontal warehouse and back-up logistics system
Value capture	Cost structure: Leasing costs, distribution costs, IT development costs Revenue stream: Online product sales, pre-made dishes, private brand, breakfast restaurants
Value creation	Key resources and process: Supply chain management, intelligent dispatching system, IoT technology, intelligent dispatching system, big data technology Key partnerships: Numerous cooperatives and farmers, Shanghai LianTongDa, Persimmon Logistics Co

Value communication	Company placement advertising, new user discount, promotion booths

Value proposition

With the core guiding principle of "determine the quality, determine the time, and determine the category", Dingdong provides consumers with a convenient fresh food home service using community warehouses, and is committed to meeting the needs of community residents for cooking three meals a day, creating a "vegetable + condiment" combination, and enhancing consumer stickiness by cultivating high-frequency purchasing habits.

Value delivery

Customer segments and relationships:

"Our customer base is mainly white-collar users in neighborhoods within a 10-kilometer radius centered on the site. " Dingdong is mostly located in China's top tier cities such as Beijing, Shenzhen, and Shanghai. The fast-paced life of these users does not leave them extra time to go to supermarkets or vegetable markets to buy food after work, and they pay more attention to the convenience and efficiency of consumption. Dingdong's dense layout of Frontal warehouses around the community allows customers to receive food within half an hour at the earliest after placing an order. This meets the needs of most young people in top tier cities. Dingdong offers a "Menu of the Day" and a series of recipes for those who are hesitant to place orders and have limited cooking ability, which is a smart way to cultivate consumer habits and build up stickiness with merchants. The platform also has a comprehensive membership system, with members enjoying cash back and exclusive member pricing, which helps retain quality users.

Distribution channel：

Dingdong directly collects goods from the fresh food production areas around the cities and other diversified cooperative production areas, and establishes city sorting centers in North, Central and South China as a transit point for direct procurement from the production areas, and relies on city wholesale markets to complete procurement for categories that are not suitable for long-distance transportation or have relatively low demand to complete the procurement channel. Dingdong has not set up physical stores, and customers are mainly served via online orders, with a secondary mode of "city storage + community delivery", utilizing the front and back-up logistics systems.

Value capture

Cost structure:

Dingdong's cost structure mainly comes from the rental cost of Frontal warehouses. Although the dense Frontal warehouses are suitable for the storage of fresh goods and can deliver them to customers more efficiently and with high quality, Dingdong's Frontal warehouses are mainly laid out in first- and second-tier cities, which are heavy assets, and at the level of preliminary investment, Frontal warehouses need to establish a grid for coverage, and a city needs to be covered, requiring At least 100 Frontal warehouses are needed to cover a city. Dingdong also invests a lot of money in the cold chain insurance system because of the easy loss of fresh produce in storage and circulation. 2020 fulfillment costs are 1,936.9 million yuan and 4,044.2 million yuan respectively, accounting for 49.9% and 35.7% of the company's current operating revenue. Fulfillment costs are mainly composed of elements such as warehouse rentals and wages of delivery personnel. In addition to fulfillment costs, Dingdong has invested more in the development of its IT system. Dingdong uses big data to detect inventory status. The AI intelligent inventory management algorithm developed by the company calculates replenishment, streamlining inventory while replenishing it in a timely manner to achieve a balance between supply and demand.

Revenue stream:

Dingdong's revenue currently relies mainly on online product sales, and through its financial report, Dingdong's net profit for 2019-2021 is -1.873 billion yuan, -3.177 billion yuan and -6.43 billion yuan respectively, totaling over 11 billion yuan. As a result of the continuous losses, Dingdong has turned to new profit models in recent years. Dingdong launched "boxing shrimp", hot pot and other pre-made dishes with high gross margins, while accelerating the construction of its own brand to improve scale and efficiency, reducing the overall procurement costs. Dingdong has also established three offline breakfast stores in Shanghai to find new ways to make money. According to Dingdong's earnings report, it has already achieved break-even in the first quarter of 2022.

Value creation

Key resources and processes:

Dingdong's key processes is its excellent supply chain management. Dingdong has for the first time adopted intelligent robots capable of sorting operations in cold storage rooms at -30 degrees Celsius in its regional central warehouse, and in the freezer environment, the intelligent robots significantly reduce the efficiency of

personnel walking for example, and increase the efficiency of cabin operations by 30%, which can save 4 people in a single shift of labor under the premise of planning capacity. Meanwhile, Dingdong is gradually matching intelligent platforms and systems such as warehouse management system WMS, intelligent manufacturing system MES, warehouse control system WCS and automated production. This is gradually replacing traditional manual operation and management with efficient and accurate management platforms and systems. Dingdong's Frontal warehouse has completely replaced the manual dispatching system, which relies on human judgment and experience. The intelligent dispatching system will use machine learning, operation optimization and other algorithms to realize automated dispatching and effectively improve the logistics operation efficiency of the Frontal warehouse. During the transportation of fresh commodities, Dingdong is also able to set different temperature control requirements according to different goods by integrating GPS, temperature sensors and other hardware devices, and notify dispatchers with alarms for abnormal transportation in-transit driving conditions such as over speeding and abnormal parking, so that timely intervention can be made to ensure the safety and control of fresh commodities in each link. In addition to food e-commerce, Dingdong will also expand other related businesses, such as self-built pork processing plants, which will not only improve profits, but also generate their own brand of products to sell on food e-commerce, expand product ranges, improve gross margins, and strengthen supply chain control.

Dingdong's core is to apply big data technology throughout the whole industry chain. The intelligent brain currently deployed by Dingdong Buy Grocery will provide an accurate procurement decision basis for upstream procurement through big data and algorithm prediction. This prediction is combined with historical data, season, weather and other dimensions. At the same time, it will make smart distribution and allocation to Frontal warehouses based on the comprehensive data of each Frontal warehouse. Based on the order forecast of the algorithm, the goods needed by Dingdong can be put into production in advance at the production end. The information disclosed by Dingdong Buy shows that this intelligent brain can achieve an overall sales forecast accuracy rate of more than 90% and a popular single product forecast accuracy rate of more than 95%, thus helping Dingdong achieve a balance between the satisfaction level of commodity services and supply loss. Big data analysis also plays a key role in the selection of the location of the Frontal warehouse. This is because Dingdong chooses the place where it can cover more target customers to set up the Frontal warehouse. It also optimizes the distribution path according to the results of data analysis, which greatly reduces Dingdong's cost in operation. Dingdong has built its own "supply chain digitization" traceability system, which is supported by automated freshness and temperature control systems and intelligent warehouse management systems in

sorting, warehousing, and distribution, etc. It integrates and shares various information systems to achieve logistics and transportation transparency and data, and realizes systematization in route optimization, intelligent scheduling, and transportation capacity stratification. Operation and real-time dynamic monitoring of the whole process, and gradually realize the digitalization of the whole supply chain.

Key partnerships:

Since its establishment until August 2019, Dingdong has formed a mutually beneficial partnership with more than 200 cooperatives and 3,000 farmers and breeders, including Shanghai farms. Through an efficient and perfect supply chain system, it empowers agricultural bases while also improving the supply side of the agricultural supply chain to meet consumers' needs, by sourcing fresh, safe and reliable agricultural products for consumers and delivering fresh ingredients directly to consumers' homes. Dingdong now authorizes Shanghai farms as cooperative bases for direct sourcing, and closely integrates with suppliers; Dingdong's vegetables, aquatic products and other fresh products that are difficult to transport over long distances are mainly purchased in city batches, so it does not have to bear the loss of these products on the way, nor does it have to build its own overly complicated cold chain logistics. In 2020, Dingdong entered into a strategic cooperation with Shanghai Unicom to customize its "intelligent cold chain logistics and storage management system" to optimize the supply chain, reduce losses and save costs. In 2019, Dingdong will invest 10 million yuan to establish Shanghai Persimmon Logistics Co.

Value communication

Channel for communication:

The company aims to promote its light marketing model through three ways.

1: Advertise in "Mom Help", a company founded by Dingdong's founder, which can precisely target young mothers, one of Dingdong's target customers, with low cost and positive effect.

2: Promotion through user fission, Dingdong's new users can get big coupons when they register, and old users can also get coupons when they share and recommend new users to register. Dingdong and Tencent have agreed to cooperate on platform payment, traffic pooling, social media advertising, etc., expanding brand communication on social media. Dingdong also launches limited-time shopping activities at different times of the day to stimulate users' consumption.

3: By setting up promotion booths at community entrances, we guide and instruct residents in the community to download Dingdong APP, and after downloading the APP, they will receive low-cost eggs, seasonings and other products when they place orders, so as to attract users who may have the need to buy food at low cost.

4.1.3.3. Practice description and Changes in COVID-19

Upstream

C3-UP1: Direct sourcing

In the early stage of Dingdong's establishment, it adopted a combination of bulk purchase from neighboring cities and independent supply from suppliers in neighboring cities. Although bulk purchase from neighboring cities has the advantages of stable prices, complete categories, convenient delivery and easy replenishment, due to the long supply chain, high loss rate of demurrage and high operating costs of Frontal warehouses, the price of products is much higher than that of supermarkets. Dingdong also adopted the method of direct sourcing to shorten the supply chain, which has been mentioned before, so I won't elaborate too much here; Dingdong has reduced the procurement cost through direct sourcing, so it has influenced Dingdong's cost structure in its business model. This is also one of Dingdong's Key processes.

C3-UP2: Farmers' direct sales model

In most agricultural areas of China, there is still a problem of information lag, and it takes time for changes in the market to reach farmers. Therefore, the food grown by some farmers does not meet expectations in the season of sale. This leads to a large amount of food waste. Dingdong's procurement method is 90% direct sourcing. Therefore, farmers are considered Dingdong's main upstream partners, and Dingdong can assist farmers in planting through data, which improves the efficiency of the whole supply chain. Dingdong improves the efficiency of the whole supply chain through data-assisted farming.

C3-UP3: Building the "Dingdong Agricultural Ecosystem"

Dingdong creates a complete regional agriculture ecology in some agricultural areas by unifying various resource elements of production, supply, sales and customer purchase, establishes a science and education training center to provide seedlings, training and technology for local farmers, performs the whole process from seed breeding, soil cultivation, sowing, cultivation and harvesting according to Dingdong's standards for buying vegetables, and adopts green planting methods to continuously reduce fertilizer and pesticide use to improve the rural ecological

environment. Based on the standard system in the three major aspects of seeding and breeding production, finished product acceptance and storage and transportation, Dingdong exports standards to upstream agriculture and provides technical support. Currently, Dingdong has developed 540 agricultural direct-picking bases nationwide, and in the first half of 2022, the purchase volume of Dingdong Buy Choi agricultural products increased by 62% year-on-year, driving sales of agricultural products in upstream help areas to 1.37 billion yuan in the same period. By using its powerful intelligent logistics and distribution system, Dingdong makes its upstream suppliers profit by creating a mechanism of benefit sharing between all suppliers in the supply chain, so building a sustainable agricultural ecosystem is also one of Dingdong's key resources.

C3-UP4: Intelligent cold chain logistics warehouse resource management information system

Cold chain warehousing is a kind of warehouse for fresh food and other items that need to be refrigerated for temporary storage at the transfer station, which monitors the temperature and humidity of the warehouse through temperature and humidity control equipment (cold storage). Including the use of automatic three-dimensional shelves, smart sorting, logistics robots, temperature monitoring and other equipment applications to create an automated unmanned cold chain warehouse. At the logistics end, we use vehicle-mounted intelligent terminals and wireless sensors to realize the temperature and humidity data of the entire cold chain of fresh products and the specific geographic location detection of cold chain vehicles, etc. Dingdong has leveraged its warehouse resource management information system to reduce losses and accelerate the operational efficiency of the entire supply chain, which is Dingdong's highly responsive technical support and is therefore one of its key resources.

C3-UP5: Agricultural poverty alleviation

Since 2018, Dingdong has visited more than 200 poor counties in 18 provinces and autonomous regions, including Guizhou, Yunnan, Ningxia and Xinjiang, and has created and implemented a precise poverty alleviation program of "downstream consumption poverty alleviation and upstream industry poverty alleviation" according to its business content and model characteristics, and has docked more than 2,500 kinds of poverty alleviation products. Zunyi local cooperatives and Dingdong bought vegetables in 2019 and completed the purchase of nearly 150 tons of bamboo in only one month. 2020, Dingdong helped farmers to alleviate their hardships through the live broadcast of origin and the opening of the "Dingdong Farmers' Products Pavilion" on the APP side. In 2020, Dingdong has helped farmers to alleviate their difficulties, with sales reaching 840 million yuan. This enables

direct employment of more than 10,000 people in poor areas. It also helps poor households to increase their income by nearly 200 million yuan. Through agricultural poverty alleviation Dingdong has improved its corporate image and shaped a different corporate image in front of the public. It also assisted and supported key partners in the upstream.

C3-UP6: New Technology Empowered Supply Chain

In the upstream, Dingdong monitors food quality from the source by developing smart agriculture. This is done by relying on the integration of modern information technology such as artificial intelligence and 3S with agricultural production. This enables precise management and visual diagnosis of agricultural production. The development of smart agriculture promotes the standardization and intensification of production, provides the basis for large-scale procurement, and effectively reduces procurement costs.

In the midstream, Dingdong promotes cold chain technology and logistics by introducing systems such as insurance system, temperature control system and intelligent warehouse management, and integrating each information into the IoT platform to achieve transparency and data for logistics and transportation. Big data analysis technology has successfully reduced its daily stagnation and logistics losses to less than 3%.

In the downstream, Dingdong continuously optimizes intelligent algorithms to calculate the best route and delivery clerk for each order through an intelligent dispatching system. Based on different dimensional data such as historical sales data, weather and festivals in the areas covered by Frontal warehouses, Dingdong makes order prediction for each commodity category under the guidance of intelligent algorithms and gives product replenishment reminders and purchasing suggestions in advance. Based on the different attributes of the regions where different Frontal warehouses are located, as well as the group portrait of the surrounding users, consumption behavior, and surrounding facilities, the intelligent algorithm selects 3,000 products from a large number of products that best meet the consumption needs of this region and realizes automated marketing. Rely on artificial intelligence and big data technology to automate operations and improve operational efficiency

As Dingdong employs a large number of technology personnel and vigorously develops a series of new technologies, such as 5G, IoT, big data and artificial intelligence, it fully integrates them into the entire supply chain, digitizing it, making it intelligent and improving operational efficiency, so it is considered one of the company's main assets.

C3-UP7: Establishing a fund to support farmers

Dingdong has set up an internal fund to help individual farmers. This fund is specifically to provide hotline assistance to fresh vegetables that cannot be sold due to debts, accounts or epidemics and are rotting in the ground. The company will select the most suitable vegetables that can be sold and sell them on its own platform. So this initiative is also seen as a way for Dingdong to deepen its relationship with its key upstream partners.

Focal company

C3-FC1: Vegetable and condiment combinations

Dingdong's positioning is particularly clear, which emphasizes the idea that to better serve the needs of users cooking, it should focus on combining fresh ingredients and condiments. Unlike other food e-commerce companies, Dingdong has a very rich vegetable category, as well as an online variety of condiments, and these condiments have been categorized into condiments, seasoning sauces, and seasoning oils, which are more suitable for Chinese cuisine. Even the offline supermarkets with complete categories will not put all these low-frequency condiments on line when they do online business. Creating a combination of vegetables and condiments ensures the product category, centralizes user needs, and realizes a one-stop purchasing experience for user services. Vegetables and condiments create convenience for users while cultivating their purchasing habits, enhancing user stickiness and deepening the customer relationship between Dingdong and its customers. This combination generates synergy and positive mutual feedback, increasing Dingdong's revenue and therefore influencing Dingdong's revenue stream.

C3-FC2: New business of pre-made dishes

Dingdong's pre-prepared food series currently has over 1,000 SKUs, including both cut and washed clean dishes that are ready to be served at the table after unpacking and reheating. Dingdong's pre-prepared vegetable series currently has more than 1,000 SKUs, including both cut and washed net dishes that are ready for the pot, as well as self-researched ones that can be put on the table after unpacking and reheating; for the whole year of last year, Dingdong's pre-prepared vegetable series sold more than 100 million copies nationwide. The increase of pre-prepared vegetable business has greatly improved Dingdong's revenue level and impacted the revenue stream.

C3-FC3: Development of private brands

Dingdong has been developing its own brand business since 2020, including potato brand, bakery brand "Paul's Factory", beer brand "1972 Farm", ice cream brand "Chao Li Zhi", and food processing plants. "Dingdong's main focus is on 3R food (Ready to cook, Ready to eat, Ready to heat). According to Dingdong's forecast, the market influence of its own brands such as "Boxing Shrimp", "Dingdong Da Man Guan" and "Dingdong Ace Cuisine" will grow gradually. According to Dingdong's forecast data, the proportion of Dingdong's own brands in the overall GMV will rise from 5.8% to about 30% in 2022. The increased scale effect brought by private brands can bring greater bargaining power and reduce the procurement cost of upstream raw materials. Ownership of brands can increase revenue through sales and also improve Dingdong's brand capabilities, so it changes Dingdong's revenue stream and is an important process.

C3-FC4: Quality control team

According to Dingdong's interview, in terms of fresh food quality, the company has a quality control team of over 500 people. On the basis of qualified test reports provided by suppliers, Dingdong's lab will conduct 100% rapid testing on all fresh ingredients after they enter the warehouse. In terms of testing technology, Dingdong Buy Lab currently uses the industry's usual enzyme inhibitor method for fruits and vegetables. This method is used to quickly identify the residual concentration of organophosphorus and carbamate pesticides. In addition, Dingdong Quality Control applies the colloidal gold method, which is highly sensitive, accurate and more cost-effective. For aquatic products, Dingdong has set up on-site testing laboratories in its warehouses across the country, with technical support from Intertak, a consumer product testing and certification company. On top of this, Dingdong's quality control team also regularly sends samples to international third-party inspection agencies for accurate and quantitative testing to ensure the food safety of Dingdong's fresh food ingredients. At the same time, Dingdong has formulated the "7+1" quality control process, which includes eight processes: quality control of goods source, quality control of large warehouse, quality control of processing, quality control of Frontal warehouse, quality control of inspection, quality control of sorting, quality control of customers and after-sale service. The quality of Dingdong products is ensured by the high-quality control system, so it is one of Dingdong's key processes.

C3-FC5: Founded Yunshan College

Dingdong employs highly paid senior instructors from around the world to give weekly training to employees through the establishment of Yunshan College. The training includes knowledge of business skills for technical staff, corporate management and communication skills for management, and basic information on

the company charter, strategic goals, and company culture for new employees. It also includes training on academic qualifications, and employees can learn other skills such as languages at Yun Shan College to broaden career options and growth opportunities and gain new promotion opportunities. By strengthening the vocational training of employees, it increases the bond between employees and the company and improves the overall staff level of the company in the long run, so it is considered as one of Dingdong's key processes.

C3-FC6: Participation in social welfare projects

Over the years, Dingdong has always taken corporate social responsibility as an invaluable cornerstone of its development. Dingdong has donated 4.25 million to Shanghai Military Support Foundation and organized public welfare activities for the visually impaired. Dingdong has also donated 100,000 yuan to the Shanghai Youth Charity Foundation to carry out the "Youth War on Epidemic, Hope for the Future" campaign. Dingdong also donated 100,000 yuan to Shanghai Youth Charity Foundation to carry out the "Youth War and Hope" campaign to help 10,000 youths in difficulty, and 60,000 yuan to Shanghai Foundation for the Aged, and also set up a fund to carry out charity activities and donate the activities to poor areas. Changzhengf Hospital, 239 families of medical personnel, delivering free food every day until these personnel return to Shanghai safely. Actively carry out corporate social responsibility, enhance corporate image and deepen the impression of the Dingdong brand in the public mind.

Downstream

C3-DW1: Delivery by electric vehicle

We learned from the interviewees that Dingdong uses all-electric energy vehicles on the delivery side, just like Food Line Fresh. Compared with the price of oil, electric vehicles use lower electricity costs, and the shorter mileage limit of electric vehicles just makes up for the 3km range of delivery with Frontal warehouses. Due to Chinese policies encouraging companies to use electric vehicles and providing subsidies, Dingdong's delivery costs are reduced and its cost structure is affected by the use of electric vehicles.

Influence of COVID-19

Dingdong's logistics have been mostly affected by the outbreak of the Covid. On the one hand, travel restrictions and even blockades may occur in certain areas or cities. On the other hand, the epidemic has caused delays in the return to work of some logistics employees. Therefore, Dingdong's upstream suppliers have experienced problems such as untimely delivery and late arrival during the epidemic, resulting

in insufficient food supply and expired food. Meanwhile, due to the restrictions on access to the community, Dingdong's delivery timeliness was affected, which reduced the customer experience. In addition to the strict epidemic prevention measures, Dingdong needed to purchase the necessary epidemic prevention items for delivery staff, which led to the increase in delivery costs.

Table 15: Dingdong (*Frontal warehouse*) practices summary

ID	Practice
C3-UP1	Direct sourcing
C3-UP2	Farmers' direct sales model
C3-UP3	Building the "Dingdong Agricultural Ecosystem"
C3-UP4	Intelligent cold chain logistics warehouse resource management information system
C3-UP5	Agricultural poverty alleviation
C3-UP6	New Technology Empowered Supply Chain
C3-UP7	Establishing a fund to support farmers
C3-FC1	Vegetable and condiment combinations
C3-FC2	New business of pre-made dishes
C3-FC3	Development of private brands
C3-FC4	Quality control team
C3-FC5	Founded Yunshan College
C3-FC6	Participation in social welfare projects
C3-DW1	Delivery by electric vehicle

Ad-hoc practices

Cooperation with government and provide meals for epidemic prevention-related personnel:

Dingdong's interviewees said that during the Covid period, Dingdong received regional epidemic control at the distribution end. This led to problems such as untimely supply and delivery, thus causing Dingdong's sales to be affected. Therefore, Dingdong combined its brand advantages and reached cooperation with the government. As a result of communication with the government, Dingdong's delivery vehicles were provided with vehicle privileges, so that they could enter and exit the controlled areas freely without being restricted. At the same time Dingdong also cooperated with the government to provide segregated meals for people in quarantine. This included individuals and enterprises, which greatly boosted Dingdong's revenue during the period.

Development of community group buying:

Dingdong's delivery personnel during the Covid period were also restricted by the access of the district, which affected Dingdong's delivery service, so Dingdong also vigorously developed community group buying business during the Covid period, by aggregating the orders of district customers on the platform one day, making centralized procurement, reducing procurement cost through the advantage of scale, and at the same time, placing food at the centralized container in the district by timing and fixing the food on the next day. Food was placed in the centralized container the next day through regular and fixed time, and the last mile of delivery was completed by minimizing offline contact, which reduced the economic loss of delivery personnel due to delivery limitations.

Table 16: Dingdong (*Frontal warehouse*) in COVID-19

Impact of COVID-19	**Ad-hoc measure taken as reaction**
To business sales plummeted	Cooperate with the government to obtain qualified epidemic prevention and control communities for distribution
	Develop a community group purchase model
	Provide raw materials for catering services for epidemic prevention-related personnel

4.1.3.4. Sustainable performance analysis

Economic

Cost

On the procurement side, Dingdong uses the same model of direct sourcing as Shixing Fresh. "The advantage of direct sourcing is that it can reduce costs by

eliminating intermediate links and lowering costs by at least 30%". As previously mentioned, Dingdong empowers the entire supply chain through the development of big data, AI and other advanced technologies. In the upstream, the development of smart agriculture promotes the standardization and intensification of production, providing the basis for large-scale procurement and effectively decreasing procurement costs. By providing real-time dynamic monitoring of logistics and transportation, the midstream can reduce the loss of fresh produce during transportation and maximize the efficiency of cold chain transportation. In the downstream, artificial intelligence and big data technology can automate operations and enhance operational efficiency. By continuously optimizing each link in the supply chain, it can achieve cost reduction and efficiency (Han 2021). By building an intelligent cold chain logistics warehouse management information system, Dingdong has improved the operational efficiency of its cold chain warehouse on the one hand, and optimized its supply chain to reduce food loss, resulting in significant cost savings, according to the Chinese News (2021). On the distribution side, Dingdong uses new energy vehicles for delivery, which also reduces delivery costs compared to other fresh food companies that use oil trucks. "The operating costs of the front-end warehouse are too high, mainly in two areas: one is the rent of the front-end warehouse, and the second is the labor cost of sorting and distribution. " Dingdong's interviewer said that although Dingdong has made many initiatives in cost control compared to other Frontal warehouse model companies, Frontal warehouse companies need to lay a lot of costs in terms of warehouses, stores, logistics, etc., and excessive warehouse rent and labor costs.

Profitability

In 2020, Dingdong launched the business of prepared dishes, which is to offer for sale 3R foods on the platform. "The advantage of prepared dishes is in the higher gross profit, which can reach roughly 17%-20%."The business innovation of pre-made dishes not only meets the changing consumer demand, but also breaks the constraints of the fresh food category, while the semi-formed dishes have high gross margins, which can increase the price per order for customers and improve profitability. At the same time, Dingdong further continues to develop its own brand business. "The benefit of these private brands is that they can use the platform brand advantage to gain consumer trust and goodwill, and quickly enter the market. "Dingdong 2021 in 14 cities with 40 regional processing centers, such as self-built pork processing plants can be deeply involved in the processing chain, not only to improve profits, but also to own branded products to feed back into food e-commerce product sales, expand product variety, improve gross margins, and strengthen supply chain control while not distracting headquarters". "Dingdong's current performance is insufficient in terms of profitability. "As previously

mentioned, Dingdong's operating costs are too high, and according to the interview, Dingdong's current business priority is to reach the break-even point.

Food wasty

In the cold storage, Dingdong has developed an intelligent cold chain logistics warehouse resource management information system with advanced unmanned vehicles and sensors. "Dingdong uses recyclable vegetable frames to carry and transport vegetables in the summer to avoid crushing and spoilage problems caused by packaging in plastic bags. Dingdong also uses recyclable insulated boxes for summer deliveries, which isolate frozen and room temperature products through ice or wooden boards to minimize losses during transportation. "Although Dingdong has made many measures to contribute to food loss, creating a relatively significant positive effect, Dingdong still has an overall food loss rate of about 10% due to the fact that it takes a demand forecasting model and Dingdong puts the freshness of the goods first, so there are no other measures to deal with the unsold freshness of the day (Yang 2022)

Social

Food safety

"As a double experience champion rated by the Beijing Consumer Association and the Shanghai Consumer Protection Commission in 2020, Dingdong's winning key is food quality. ". From the company's website, knows that Dingdong inspects 100% of its directly harvested products by establishing a professional quality control team and building experimental bases, incorporating enzyme inhibitor methods and colloidal gold methods. In aquatic products, Dingdong has the support of Intertak, which uses advanced global testing methods. Dingdong has also gained some exclusivity in meat, eggs, milk, and other food categories to ensure food safety. "In addition to a complete set of tests before the goods leave the warehouse, all fresh goods will be screened again by the delivery staff after they leave the warehouse, and the freshness of the goods will be carefully confirmed after they are delivered to the users". After delivery, the freshness and integrity of the goods will be carefully inspected. In addition to this, the company has established an intelligent cold chain logistics warehouse resource management system that can also detect products in a low temperature environment. The IOT technology used allows for the traceability of each product. This technology, as mentioned before, can mainly locate the same batch of products quickly to identify problems. It can also help Dingdong better prevent and avoid food safety issues in the future.

Social welfare

"Dingdong's current regularized philanthropic initiatives will have a number of funding programs for poor families. " Since its inception, Dingdong has continued to participate in social welfare initiatives, including caring for the visually impaired, donating to the Senior Fund, and supporting underprivileged teenagers. " During its time at COVID-19, it has taken on the task of delivering food to blockaded areas such as Wuhan, Shanghai and Shenzhen, as well as providing free meals to disease-resistant families, among other things. "The company has received social honors such as the Pudong New Area Corporate Social Responsibility Up to Standard Enterprise."

Labor right

Dingdong's policy on employee benefits is very comprehensive, " including the creation of the Yunshan Academy, which provides systematic career skills training and career planning for employees. There are also provide stock or options for employees who do well in their daily work. Because the rider is delivering directly to the consumer every day, this incentive firstly encourages the rider to do a good job of service, "and secondly helps them to get out of poverty and get rich. This initiative is equivalent to adding a portion of sales commission to the rider's delivery income, which is also considered a part of employee welfare.

Contractual stakeholders' influence

"Dingdong has helped upstream suppliers mainly through support and has improved the stability of the supply chain. " This includes the establishment of a foundation, "for some fresh vegetables that can't be sold for other reasons such as debt, accounts or epidemics and are going to rot in the ground, the company will provide hotline assistance to help these farmers through the foundation to solve these similar problems. The company will purchase and sell these vegetables that are still available for sale. " Dingdong also assists underprivileged farmers develop growing skills. For poor areas, Dingdong works with local agricultural societies to integrate small-scale, scattered resources in the hands of poor subjects by signing contracts or orders, and provides services such as technical support and broadening sales channels for poor households. Dingdong has also built the "Dingdong Agricultural Ecosystem" to bring together the agricultural industry chain and promote the market-oriented, intelligent and digital upgrade of China's agriculture technology industry.

Environmental

Air emission

"The company is mainly considering electric vehicles for environmental protection". Dingdong also focuses on developing intelligent algorithms that can optimize delivery paths, thereby reducing carbon emissions to some extent. Another initiative is Dingdong's cooperation with upstream farmers to input Dingdong's quality standards to them, "by requiring farmers to adopt green farming methods, consistently use less chemical fertilizers and pesticides, and grow organic vegetables, etc., to reduce net greenhouse gas emissions during production and improve the ecological environment in rural areas".

Package material used

Based on interviews and literature searches, Dingdong has not been found to have contributed to recyclable packaging. On the contrary, Dingdong received a 20,000 yuan penalty from the Shenzhen Municipal Bureau of Market Supervision on July 19, 2022, for failing to comply with the "Plastic Restriction "policy in China.

4.1.4. Yonghui Supermarket *(New retail)*

4.1.4.1. Company profile

Founded in 2001 as one of China's top 500 companies, Yonghui Supermarket was also one of the first companies to introduce fresh produce into modern supermarkets. Since its inception, Yonghui Supermarket has continued its high-quality development. Currently, Yonghui Supermarket has developed over 1,000 supermarket chains across the country, with operations covering 29 provinces and 583 cities, and an operating area of over 8 million square meters. Compared to other supermarkets, fresh produce is a special feature of Yonghui Supermarket, which is particularly historical in origin, as Yonghui Supermarket was one of the first supermarkets to change from a farmers' market to a supermarket in China. In 2017, Yonghui Supermarket successfully transformed into a New retail format "Super Species", while the "Yonghui Life APP" was also launched. The app was also launched. Through the "Yonghui Life App", consumers can self-checkout at all offline shops, or place orders directly online and wait for the goods to be received at home.

4.1.4.2. Business description

Table 17: Yonghui *(New retail)* business model dimensions summary

Business model dimensions	**Description of the case**
Value proposition	Convenient, safe, green and humanistic, offering tens of thousands of products and delivery service within 3 km to home
Value delivery	Customer segment: Consumers near the stores are of a wide range of ages and consumption levels Distribution channel: Three sourcing methods, with most products distributed to storage centers, and contact with consumers through stores and distribution systems
Value capture	Cost structure: Operating costs, investment in new stores, online software maintenance, investment in new formats, logistics and warehousing costs Revenue stream: Merchandise sales, food processing, restaurant business rentals, private brands
Value creation	Key resources and process: Large number of stores and members, many years of business experience, perfect procurement system, cold chain logistics system Key partnerships: Establishing vegetable bases with many regional agricultural academies and cooperating with JingDong to Home Logistics
Value communication	Lower prices than competitors, evening and weekend discounts, tiered sales

Value proposition

With its business philosophy of convenience, safety, greenery and humanity, Yonghui Supermarket is committed to leading modern agriculture and safeguarding people's health. It offers tens of thousands of products, including fresh food, foodstuffs, department stores, home appliances, and many other categories, and provides services like on-site consumption in offline shops and home delivery within 3km.

Value delivery

Customer segments and relationships:

Yonghui Supermarket's customer base consists mostly of consumers near the offline stores, who span a wide range of ages and consumption levels. According to Yonghui's respondents, the offline stores are divided into morning and evening markets, with the morning market mainly attracting middle-aged and elderly

people with fresh food, and the evening market attracting young people with casual food, alcoholic beverages, etc. Yonghui has also launched different types of offline stores such as red label stores, green label stores, fine label stores, super species, and community convenience stores. These stores target consumers of different consumption levels and ages. Among them, Super Species is more oriented to young people and focuses more on the consumption experience. Consumers can buy ingredients in the stores and process them for free on site, or they can place orders on the online platform and have them delivered to their homes within two hours, and the goods inside are relatively high-end and high-quality, and the prices are relatively high. Community convenience stores focus on the convenience and timeliness of shopping for local residents.

Distribution channel:

There are three procurement methods for fresh products in Yonghui Supermarket: national unified procurement, regional direct procurement and supplier procurement. National unified procurement is suitable for commodities with a centralized origin and a large procurement quantity that can be preserved for a long time. Examples are rice, flour, grain and oil. Direct regional procurement is appropriate for products that cannot be transported over long distances or stored for a long time. This includes leafy vegetables, soybean products, etc. Supplier sourcing, which includes cooperatives and wholesalers. Each offline store submits a list to its superior department according to the sales and inventory situation of the day, and then sends it to the purchasing staff after uploading and summarizing it in layers, so that real-time purchasing information is available. Yonghui Supermarket has established a supply model based on a self-built cold chain logistics system and warehousing center, supplemented by direct delivery from suppliers. Some of the goods purchased by suppliers will be delivered directly to stores by suppliers; fresh products purchased in bulk will not be delivered directly to supermarket stores, but first to logistics centers, which will then deliver the products to stores. Yonghui supermarkets engage with consumers mainly through their offline stores and distribution system. The offline stores establish multiple touch points with customers through shopping, food processing, catering, events and other functions to meet consumers' different consumption needs. As part of its distribution system, Yonghui Supermarket mainly uses Jingdong Home for third-party delivery to deliver products within 2 hours.

Value capture

Cost structure:

In 2021, the total operating cost of Yonghui Supermarket reached 95.940 billion yuan, an increase of 279.18% or 67.336 billion yuan compared to 2012. The increase in procurement costs is the main reason for the increase in operating costs. On the one hand, Yonghui Supermarket has been increasing and expanding the number of supermarket chain stores and its own logistics center in the process of growth, while improving and perfecting its operation methods and store management mode; on the other hand, since 2015, Yonghui Supermarket has started to accelerate the layout of novel business formats and carry out scientific and innovative retail superstores, coupled with the bottleneck of offline retailing encountered by traditional retail superstores and the fierce competition from competitors in the same industry. This, coupled with the offline retail bottleneck encountered by traditional retailer supermarkets and the fierce competition from competitors in the same industry, has required continuous sales management, broadening sales channels and capturing a larger market share. In addition to operating costs, Yonghui's major costs include investment in physical stores, which includes store renovation, equipment purchase, etc. The maintenance and construction of the online official website, the development, maintenance, and operating costs of the Yonghui Life APP. The increase in the number of stores has led to an increase in the number of orders and the frequency of goods delivery. This has resulted in an increase in the cost of warehousing and logistics.

Revenue stream:

The revenue sources of Yonghui's physical stores mainly include revenue from merchandise sales, service fees from consumer food and beverage processing, and rentals from food and beverage companies moving in. Online businesses rely on merchandise sales as the main income. Yonghui also offered food processing and catering services in its physical stores, and recruited merchants externally to move in. The commissions that merchants pay to Yonghui are also a source of offline revenue. In addition, the interviewees of Yonghui also said that after the listing of Yonghui, they set up their own decoration company, advertising company, etc. in the face of the demand for massive store expansion. While reducing the company's purchasing costs, it was also able to increase revenue through services to other companies. Because of the guaranteed sales volume, Yonghui sells advertising space in elevators, shelves etc. These advertising revenues are another one of Yonghui's sources of income.

Value creation

Key resources and processes:

The core resource of Yonghui Supermarket is its extensive distribution of physical stores nationwide. Yonghui has opened 1,052 stores in 575 cities in China, with 139 stores under construction. The advantages of a large number of physical stores and a wide range of outlets are extremely beneficial to the supermarket's online retailing of offline diversion online, and offline co-development. According to the interviewees of Yonghui, the number of registered members in Yonghui supermarket is close to 300 million. As a result of the huge accumulation of customers at Yonghui, the company is able to maintain a high operating income, and this is also an advantage in the current fierce competition in the food e-commerce market. The freshness in the products on the shelves of supermarkets is ensured by the fact that the products are supplied in appropriate quantities and batches. Once the quality and quality of the products deteriorate, they are immediately sold at a discount. By combining the above core resources, Yonghui Supermarket has established a positive reputation in consumers' minds, which has greatly contributed to the promotion of online business.

The key process of Yonghui Supermarket lies in the high-quality food procurement and supply channels it has been cultivating deeply and the physical stores with multi-line layout. The company has developed upstream fresh procurement channels by setting up a nationwide fresh agricultural products marketing network, regional direct procurement system, and internal commodity preservation research and development institute, which has greatly reduced the number of intermediate links in the food supply chain, decreased logistics, storage, and loss costs, and maximized the quality and competitiveness of fresh products. At the same time, the company has also set up its own cold chain transportation and logistics system, which is divided into seven regions to enable regional deployment and rapid deployment of resources, improve operational efficiency, and reduce These key processes allow Yonghui to target different consumer groups through different products and services, with huge market potential.

Key partnerships:

In the upstream, Yonghui cooperates with the Academy of Agricultural Sciences in several regions. Through the support of the Academy, Yonghui Supermarket has established several vegetable bases and implemented pollution-free standardized production technology demonstrations. Yonghui also cooperates with local fresh produce growers to meet the special needs of consumers, lowering procurement costs and reducing the food distribution chain. In the downstream, Yonghui has entered into a strategic cooperation with Jingdong, and both sides have docked their platform data ports to synchronize inventory and other information. Yonghui Supermarket has further upgraded and improved its O2O model with Jingdong

Home Delivery Service, which can provide home delivery service for consumers within 3 km of physical stores. Consumers can place orders and make payments on the Jingdong Home App. Jingdong's couriers will pick up the goods from the offline supermarket and deliver them to consumers instantly, enhancing the efficiency of the transaction process.

Value communication

Channel for communication:

Yonghui participates in the entire process of purchasing and selling goods. It keeps up to date with the market situation of goods, and quickly changes prices according to the market situation of goods and competitors' prices. Affordable prices attract a large number of customers and create an image of "high value and low price every day" for consumers. Yonghui also uses a variety of promotions such as limited time sales, bundled sales, and discounted prices to speed up the circulation of fresh products. This ensures the freshness of the products. After 9:00 p.m., many products in the supermarket are discounted, and on weekends, various specials are vigorously offered to attract customers. Young people pay more attention to the quality of products, are not sensitive to price, and pursue the experience of non-daily fresh products; older people do not pay too much attention to product quality, but are very sensitive to price and prefer daily fresh products with low prices. Therefore, for different categories of consumers, Yonghui prices products based on their quality and availability. The company adopts a graded sales approach to meet the needs of all segments of consumers and maximize profits.

4.1.4.3. Practice description and Changes in COVID-19

Upstream

C4-UP1: Combination of provincial procurement and direct source

Depending on the quantity and quality of goods purchased, Yonghui has adopted various procurement methods. Most of the fresh food, such as vegetables and soybean products that are not easy to transport over long distances and stored for prolonged periods of time, are purchased in the vegetable markets around the stores through the provincial procurement mode, and each city carries out centralized purchasing every day based on the data of previous sales, and then delivered to different stores by special logistics vehicles according to the different needs of each store, ensuring the freshness of the goods every day while increasing flexibility to replenish the stock at any time. For products with high sales volume, easy preservation and high gross profit, Yonghui has established more than 20 agricultural planting cooperation bases across the country. These bases reduce

procurement costs through large procurement volumes, while ensuring the stability and safety of Yonghui's agricultural products supply. The procurement model of Yonghui is one of the core processes accumulated by Yonghui for a long time, and also influences the cost structure of Yonghui.

C4-UP2: Development of cold chain distribution system

As the scale of the enterprise grows and the number of fresh food orders increases, Yonghui develops its cold chain distribution system in terms of standardization and informatization. In terms of standardized construction, the construction of cold chain system projects for supermarket retail terminals is carried out in Yonghui stores, i.e., at the store end, newly constructed and reconstructed stores are renovated with cold chain front display and storage equipment, and cold chain equipment such as PC cabinets, covered island cabinets, and cool air cabinets are vigorously promoted according to the demand for merchandise display, and the project focuses on the cold storage and preservation of agricultural products at retail terminals. According to the construction specifications, the full renovation of cold storage, freezer cabinets, refrigerated vehicles, as well as other cold chain equipment will be undertaken, with monitoring equipment being introduced to achieve intelligent real-time monitoring of critical indicators, such as the temperature and humidity of cold storage areas and the status of cold storage doors. The system will also connect to the Ministry of Commerce monitoring platform to increase monitoring. The self-built warehousing and logistics system at Yonghui Supermarket has improved to an extent in terms of cost control, complexity of service, flexibility of transportation, and response speed of logistics, so it is considered as one of Yonghui's core resources.

C4-UP3: Food Safety Cloud

Yonghui builds a food safety cloud network and accesses the traceability platforms of local governments. Yonghui builds 28 new testing sites in 2021 and has now built 282 of them, covering 30 provinces and cities of fresh produce origin, docks, logistics, and suppliers. Farmers and suppliers can enter production information in the cloud network system, testing information is uploaded in real time through testing equipment and Internet of Things technology, and qualified agricultural products are generated by the cloud network to generate a certificate of compliance; logistic incoming and outgoing goods and store incoming information are entered when they reach each link node; consumers can view daily public information on agricultural products testing in the cloud screen of agricultural products, and can check the origin of agricultural products, suppliers, inspection and testing, document qualification, and traceability through cell phones. Inspection and testing, document qualification, testing room video, traceability information, etc. Not only

does this measure guarantee the safety of the goods sold, but it can also guide suppliers to optimize the planting process in accordance with scientific recommendations. So it is one of the core resources of Yonghui.

Focal company

C4-FC1: Founded renovation, advertising, and other companies

After its listing in 2010, Yonghui financed a large amount of capital and began to open physical stores in high density across the country. It adopted a combination of direct operation and franchise chain. Yonghui has a special team responsible for store location selection, construction and decoration. Therefore, Yonghui created companies related to store construction and decoration around stores, such as Yonghui Decoration Company and advertising companies. Similar to the effect of own brand, the scale effect reduces the cost of raw material procurement, thus reducing the cost of store construction. In addition, the decoration company can also perform external services to other companies to increase revenue. Yonghui sells advertising space to the public on shelves, elevators, and screens. It designs advertising content through its own advertising company to fit Yonghui's image, increasing advertising revenue while deepening customers' awareness of Yonghui. These initiatives provide revenue for Yonghui in addition to the sale of merchandise, which affects the revenue stream.

C4-FC2: Use of environmentally friendly packaging and tableware

According to Yonghui's interview, since China released the plastic restriction in 2020, Yonghui has comprehensively revised packaging materials, tableware, etc. At the transportation end, recycled packaging materials mainly include folding baskets, iron baskets, and standard trays to replace cartons, woven bags, plastic bags, foam boxes and other packaging materials. Recyclable packaging is not only reusable and significantly reduces packaging costs, but also well-designed packaging can avoid the problem of food extrusion during transportation and reduce the fresh loss rate. We use biodegradable materials in food packaging by adding additives such as starch, cellulose and degraders. In addition, we adopt environmentally friendly, recyclable and easily degradable thesis chopsticks and straws in tableware. Through the adoption of environmentally friendly packaging materials throughout the supply chain, Yonghui is contributing to environmental sustainability while enhancing the image of the company in the public.

C4-FC3: Disposal of expired products

Food goods with short shelf lives or high freshness requirements, such as fresh seafood or milk, are transformed into by-products when they are close to expiration,

such as milk ice cream or seafood chowder platters, which can be processed into food by Yonghui's food processing or catering departments and re-sold to customers. For nearly expired fresh goods, Yonghui lowers prices and takes more than 50% off for sales after 9:30 pm. For some snacks, they will be given as gifts to customers with a purchase amount of 300 or more. For goods that have been damaged but do not affect the safety of use, such as vegetables and fruits, Yonghui will give them to farmers or animal husbandry as feed at low prices or for free. Yonghui's initiative for expired products greatly reduces the loss rate of products and boosts profits, which affects the revenue stream.

C4-FC4: Employee Treatment

Yonghui conducts various employee skill training programs both online and offline, offline by offering competency-centered training programs and online by developing a learning platform that provides free online courses and online exams. In addition to this, Yonghui has established different performance categories on top of the monthly salary, such as overtime, honor bonus, employee fund, rank salary, and seniority salary. In 2017, Yonghui established the Special Mutual Aid Foundation, a non-profit charitable organization funded by Mr. Zhang Xuan Song, the founder of Yonghui Supermarket, with an initial personal contribution of 10 million yuan, and will continue to inject funds for its operation in the future, with the aim of helping Yonghui's internal employees and their immediate family members who have suffered major illnesses or accidents. The goal is to help employees and their immediate family members in difficulty who have suffered major illnesses or accidents to get through the difficult times. Employee treatment is one of Yonghui's key processes, which can increase employee loyalty and improve performance.

C4-FC5: Rural revitalization

In response to China's implementation of the rural revitalization strategy, Yonghui helps backward regions to become self-reliant and broaden a revitalization path with rural characteristics, and realizes the connection between rural areas and supermarkets through multiple ways. On the one hand, it actively encourages farmers to jointly establish professional cooperatives to improve the organization of rural business entities, and signs purchase and sales contracts with professional cooperatives to clearly agree in advance on matters such as planting scale, planting varieties, purchase price, quality and safety, and market cycle, so as to solve the worries of planting farmers and make them dare to expand their farming products to meet the bulk purchase demand of single products of Yonghui Supermarket in the long term. On the other hand, it continuously strengthens cooperation with production-oriented agriculture enterprises, which operate independently

according to the system of Yonghui, and leases agricultural land in rural areas to build standardized and standardized modern agricultural bases, with individual bases generally reaching more than 500 mu, increasing the scale of investment in agricultural bases and upgrading the infrastructure and hardware facilities of agricultural bases. In addition to helping agriculture respond to national policy, these measures also open up upstream channels for Yonghui, allowing them to influence Yonghui's key partners.

C4-FC6: Contribute to charity

As a corporate citizen, Yonghui Supermarket has been carrying out charitable activities such as helping the poor and needy, supporting education, providing disaster relief, respecting the elderly and loving the young, and donating funds and materials to society for a total of more than hundreds of millions of yuan, and at the same time, offering free meals to the anti-epidemic personnel during the Covid epidemic. In 2004, Yonghui set up a non-profit charity supermarket, which relies on the employment of laid-off workers, special-needs workers and volunteers for its daily operation, and low-income people can use the "Yonghui Love Card" to receive free supplies in the charity supermarket. Every year, Yonghui Supermarket provides more than 1,500 special-needs households in each city with no less than 50 yuan of goods per month, and Yonghui invests more than 1.5 million in charity supermarkets every year. Through public welfare activities and charity supermarkets, Yonghui has gained public reputation and shaped a different corporate image while fulfilling its social welfare responsibilities.

Downstream

C4-DW1: Different marketing strategies in the morning and evening market

By analyzing the data, Yonghui adopted a different sales strategy for the morning and evening markets to maximize the target customers and maximize profits. As a result of long-term observation of different stores, Yonghui concluded that the two peaks of shopping at supermarkets are usually morning and evening markets, while morning markets tend to be dominated by elderly people, and evening markets tend to be dominated by middle-aged and youth. Therefore, in view of the price-sensitive characteristics of the elderly, Yonghui sells freshly purchased products in the morning. By sacrificing the profit of the products and providing only 1-2 items for each category, to cover the needs of this group for a day's table consumption, to attract consumers through price and quality, to improve reputation, and to lead the city's shopping trend. The evening market, on the other hand, targets middle-aged and young people who are less price-sensitive and time-sensitive. By displaying a wide range of fresh and casual foods on the shelves, and attracting traffic with low-

priced products, Yonghui provides unique sales services and increases gross margins. By adjusting its marketing strategy to better serve different customers, Yonghui deepened its customer relationships while expanding sales and influencing revenue streams.

C4-DW2: Delivery by electric vehicle

As with Dingdong and Food Line Fresh, Yonghui also uses electric cars on the delivery side. Through the cooperation with Jingdong to Home logistics system, it covers a delivery range of more than 3km from the stores to meet the demand of customers to receive the goods within 2 hours after placing an order. The use of new energy vehicles for delivery reduces the delivery cost of Yonghui and affects the cost structure.

Table 18: Yonghui *(New retail)* practices summary

ID	Practice
C4-UP1	Combination of provincial procurement and direct source
C4-UP2	Development of cold chain distribution system
C4-UP3	Food Safety Cloud
C4-FC1	Founded renovation, advertising, and other companies
C4-FC2	Use of environmentally friendly packaging and tableware
C4-FC3	Disposal of expired products
C4-FC4	Employee Treatment
C4-FC5	Rural revitalization
C4-FC6	Contribute to charity
C4-DW1	Different marketing strategies in the morning and evening market
C4-DW2	Delivery by electric vehicle

COVID-19 influence

For Yonghui, which relies heavily on brick-and-mortar stores for revenue, the ongoing COVID-19 outbreak greatly impacted Yonghui's offline store visits. In

cities where the outbreak is severe and in complete lockdown, Yonghui also needs to close stores for disinfection as required by policy. This often takes more than a week and is a huge hit to Yonghui's revenue. In places where there is no lockdown, due to the need for daily nucleic acid testing, also reduces the willingness of customers to travel, people will mostly choose to buy online without contact, the order volume plummeted, resulting in a backlog of some goods, at the same time this led to the product is not fresh, some consumers will give up buying or is through is other platforms to buy, this period the price advantage of community group buying model also compressed At this time, the community group buying model with price advantage also compresses the market share of Yonghui, which greatly reduces the sales of Yonghui. On the other hand, like other models, Covid affected the upstream logistics and transportation of Yonghui. Some vegetables and fruits could not be transported from their sources to stores in time due to the regional blockade. During the Covid epidemic, the pickers and distributors of the stores were under closed management. This led to a shortage of employees in distribution positions to meet the manpower demand for picking and distribution. It was difficult to recruit new employees in such a situation.

Ad-hoc practices

Shared Staff:

In order to fill the vacant positions during the epidemic, Yonghui used the method of sharing employees by hiring people from other supermarkets. These individuals held the same job positions after basic training. At the same time, Yonghui will train other employees on duty so that each of them can master the skills of multiple positions. This includes sorting and distribution of goods, to fill certain positions. By using shared staff and training employees in multiple occupational skills, Yonghui was able to operate normally during the epidemic.

Discounted products and sales of anti-epidemic medical products:

After the end of the epidemic, Yonghui carried out timely replenishment through a large number of cold chain trucks and discounted clearance of previously backlogged goods. Rapid replacement created an atmosphere in which Yonghui's fresh food remained fresh after the Covid and attracted consumers. At the same time, in order to meet the needs of consumers, Yonghui sells medical alcohol, masks, nucleic acid testing and other anti-epidemic and self-testing goods in stores, and is strengthening testing and quarantine and daily disinfection work, including delivery staff must wear masks and eye masks, store staff to conduct daily body temperature and nucleic acid testing, and temperature testing of customers visiting

stores, etc., to ensure the safety and health of staff and customers, so that consumers can shop with peace of mind.

Table 19: Yonghui *(New retail)* in COVID-19

Impact of COVID-19	**Ad-hoc measure taken as reaction**
The supply side is unstable, and the goods cannot be delivered in time	When the epidemic eases, additional capacity is added to step up supply
Sales slump due to lack of supply and coronavirus lockdowns	Clear the inventory before processing
	Staffs conduct daily self-inspection
Insufficient staff in services such as distribution and sorting	Shared employment and emergency training for multi-skilled employee

4.1.4.4. Sustainable performance analysis

Economic

Cost

After the interview, it was learned that there are many cost control initiatives at Yonghui. First of all, due to the different characteristics of goods, Yonghui adopts a procurement model that combines provincial self-picking and direct sourcing. As mentioned before, direct sourcing can shorten supply chain links and decrease procurement costs, while provincial self-picking reduces transportation costs while maintaining food freshness because it is sourced from greenhouse bases around the city. According to logistics Business (2020), Yonghui optimizes warehousing and distribution resources by developing a cold chain distribution system, digitizes the supply chain, monitors the status of food during transportation and storage at all times through data to make timely changes, and uses the latest cold chain storage equipment, which can minimize losses in transportation and, thus lowering operating costs. Finally, Yonghui also uses electric vehicles for delivery at the distribution end, which helps lower transportation costs during delivery. "In the transformation process to New retail, Yonghui invested too much online, such as the construction and maintenance of the online platform, the distribution system of the delivery-to-home business, etc., and obtained very little revenue, even at a loss". Meanwhile, Yonghui adopts measures such as recyclable packaging and biodegradable plastic bags in all aspects. "These measures are good for the environment, but also increase the cost of the business. "

Profitability

"Yonghui is now operating under significant pressure, with high costs in online channels and low gross margins in offline channels". Yonghui's main revenue is from merchandise sales in its stores. This is accomplished by changing its sales model in the morning and evening in order to attract customers to the stores. Other businesses of Yonghui, such as food processing and catering, can provide customers with one-stop services from shopping, processing, eating and entertainment in offline stores, maximizing the time customers spend in stores and increasing the revenue of offline stores. In addition to revenue from online and offline sales of goods, Yonghui has created companies such as renovation and advertising companies. These companies reduce operating costs while also generating some revenue by providing services to other businesses. "Although Yonghui's operating income is high, the gross margin on merchandise is generally lower than other businesses. "

Food wasty

"Yonghui's food loss rate is far lower than other supermarkets. " By establishing a cold chain distribution system and using IOT and other technologies, Yonghui realizes real-time monitoring of the temperature, humidity and other states of each batch of goods purchased, while increasing investment in cold chain storage equipment to maximize the reduction of the loss rate of food during transportation and storage. As for vegetables that cannot be preserved and transported easily, procurement is done in greenhouses' bases. This keeps the food fresh while reducing the loss caused by backlog or temperature during transportation. As for near-expired food, Yonghui uses two methods: on the one hand, it offers discounts in the evening to attract price-sensitive customers, and on the other hand, it resells the food after secondary processing.

Social

Food safety

"The overall food safety of Yonghui in 2021 has been enhanced in recent years under the strong supervision of the local government's Food and Drug Administration, and the one-time fast inspection pass rate has steadily increased. By constructing the "one product, one code" traceability system, information about farmers, suppliers, and logistic nodes is accurately recorded, and the flow cycle of each link is made more visible, transparent, and open; by precipitating the supply chain, the analysis of the efficiency of each link can provide guidance for the management of improving the industrial chain. Analyzing and mining the data of supply chain links allows management to improve efficiency of the supply chain. At the same

time, Yonghui can use the data to guide suppliers to optimize planting, breeding and marketing in accordance with scientific requirements, strictly control the amount of medication applied according to requirements, and increase the interval between the application period and the marketing day. In 2021, Yonghui tested more than 1 million batches of edible agricultural products, with a passing rate of 99.4%. The company does not purchase goods that fail to pass the test, and the significant and prominent pesticide residue problem is under some control.

Social welfare

"Yonghui Supermarket gave full play to its supply chain advantages to raise supplies to donate to the front line of the epidemic fight, with a cumulative donation of more than nearly 10 million yuan, actively playing the role of a market player". Since its inception, Yonghui has been fulfilling its social responsibility by making public welfare a part of its corporate development strategy. Yonghui's public welfare is active in more than 24 provinces in China and is involved in many areas of public welfare. Yonghui has also founded a non-profit-oriented charity supermarket, which provides employment opportunities for the underprivileged while offering help to poor families with living materials. Yonghui and its chairman Mr. Zhang Xuan Song have received national, provincial, ministerial, and municipal-level commendations.

Labor right

"Yonghui's policy for employees is comprehensive. " Yonghui provides employees with free vocational training opportunities by recruiting instructors to provide offline learning courses, as well as establishing a learning platform online and providing online exams, and rewards outstanding employees by setting up employee incentives and using performance measures. "Since the company launched its equity incentive plan in 2017, it has issued a total of 166, 780,900 shares of restricted stock". Another is the establishment of a special mutual aid foundation to help employees who need huge medical expenses due to accidents or incidents. This foundation will raise funds through employee fundraising and corporate investment to help them get through difficulties.

Contractual stakeholders' influence

"Over the years, Yonghui Supermarket has played the leading role as a leading enterprise to help backward areas become self-reliant and broaden a road of revitalization with rural characteristics. " As a result of supporting rural revitalization, Yonghui integrates the poor farmers and agricultural societies into its own supply chain. Furthermore, it facilitates growth and development of the source origins while broadening procurement channels and ensuring supply chain

stability. "Yonghui provides support to cooperative farmers, professional cooperatives, and agricultural enterprises in many aspects such as capital, information, technology, market, and talents. " For example, it adopts advance payment to provide funds for agricultural enterprises to purchase seeds, pesticides, fertilizers and other agricultural materials; and in cooperation with the National Agricultural Technology Center of the Ministry of Agriculture, it organizes and cultivates a team of tutors and cultivates core demonstration farmers; and in cooperation with the Fujian Academy of Agricultural Sciences, it organizes experts to visit the fields to provide farmers with cutting-edge technology demonstrations, promote the use of modern agricultural machinery, and enhance farmers' agricultural skills and quality and safety awareness.

Environmental

Air emission

"Yonghui Supermarket has gradually increased its attention to environmental protection and achieved significant results in water, electricity and energy consumption in its operations. " As mentioned before, through providing planting standards to upstream farmers, Yonghui guides farmers to plant organic vegetables through scientific data and reduces the use of pesticides. Furthermore, as a perimeter procurement model is applied in the fresh food procurement process, transportation emissions are reduced. Finally, in compliance with national regulations, vehicles with high energy consumption and high emissions will be phased out, and short-distance logistics would be introduced in electric vehicles to reduce emissions.

Package material used

"Yonghui Supermarket actively responds to the plastic restriction order and strictly follows the requirements of local government, which has been well received by the public" Yonghui uses recyclable packaging such as iron frames and trays at the upstream transportation and storage end, which not only avoids the problem of food quality deterioration due to backlogs during transportation and storage, but also reduces the use of disposable packaging materials. In offline stores, "we encourage consumers to bring their own shopping bags and shopping baskets, use cloth bags, thesis bags and other environmentally friendly supplies for shopping, and promote recycling". All shopping bags provided by Yonghui are made of biodegradable polylactic acid (PLA) material. In the restaurant are used environmentally friendly thesis chopsticks, straws, etc.

4.2. Cross-case analysis

4.2.1. The BM elements differences between the food e-commerce business models

Table 20: The BM elements differences between the food e-commerce business models

Shixing Fresh (*Community group buying*)	**Meituan (*Platform-based*)**
Convenient, safe, green and humanistic, offering tens of thousands of products and delivery service within 3 km to home	Retail plus technology & Deliver everything to home
Customer segments: 30-45 years old women, high-net-worth household users in first- and second-tier cities Distribution channels: No direct offline stores + refrigerated self-delivery cabinets, Centralized procurement + independent logistics, Three levels supply chain system, T+1 distribution	Customer segments: white-collar workers and school students, spread in all levels of cities in China Distribution channels: Provide a platform to connect and match upstream and downstream needs. Provide distribution services by dedicated and outsourcing couriers.
Cost structure: Initial investment costs, Purchasing and production costs, Logistics and supply chain costs, R&D costs, Operation and management costs Revenue stream: Mainly from online product sales	Cost structure: Delivery costs and Operation costs Revenue stream: Commission from merchants, part of delivery fees paid by consumers, merchant bid ranking fee
Key partnerships: Upstream suppliers, universities and other companies Key processes and resources: pre-order model, self-pickup; high-density self-pickup point layout	Key partnerships: Upstream merchants and logistics outsourcing companies Key processes and resources: Platform operation, Delivery service; The advantage of economies of scale, refinement operation supported by Superin system
Word-of-mouth marketing	Create a good corporate image and community Fewer traditional media channels, more new and social media channels

Business model dimensions	Frontal warehouse (*Dingdong*)	Yonghui (*New retail*)
Value proposition	Quality determination, time determination, category determination Meet the cooking needs of residents for three meals a day Cultivate consumers' high-frequency purchasing habits	Convenient, safe, green and humanistic, offering tens of thousands of products and delivery service within 3 km to home
Value delivery	Customer segment: White collar customers within 10 km and layout of China's first-tier cities Distribution channle: Peripheral origin and direct sourcing, distribution through frontal warehouse and back-up logistics system	Customer segment: Consumers near the stores are of a wide range of ages and consumption levels Distribution channle: Three sourcing methods, with most products distributed to storage centers, and contact with consumers through stores and distribution systems
Value capture	Cost structure: Leasing costs, distribution costs, IT development costs Revenue stream: Online product sales, pre-made dishes, private brand, breakfast restaurants	Cost structure: Operating costs, investment in new stores, online software maintenance, investment in new formats, logistics and warehousing costs Revenue stream: Merchandise sales, food processing,
Value creation	Key resources and process: Supply chain management, intelligent dispatching system, IoT technology, intelligent dispatching system, big data technology Key partnerships: Numerous cooperatives and farmers, Shanghai LianTongDa, Persimmon Logistics Co	Key resources and process: Large number of stores and members, many years of business experience, perfect procurement system, cold chain logistics system Key partnerships: Establishing vegetable bases with many regional agricultural academies and cooperating with Jingdong to Home Logistics
Value communication	Company placement advertising, new user discount, promotion booths	Lower prices than competitors, evening and weekend discounts, tiered sales

In terms of customer base, the New retail and platform-based models have a presence in most cities in China. The Frontal warehouse model, which focuses on speed and freshness, is mainly in first- and second-tier cities, serving the white-

collar population in the neighborhood around the warehouse. The community group buying model is currently laid out mainly in first- and second-tier cities, targeting high-net-worth families.

In terms of procurement, excluding the platform-based model, both the Frontal warehouse, community group buying and the New retail take full advantage of the characteristics of the goods, using a combination of peri-urban procurement and national direct procurement, shortening the supply chain and improving the quality of food. Platform-based models and Frontal warehouse models mainly place orders online and deliver products to customers using self-built logistics and distribution systems, while community group buying utilize self-pickup at offline locations, reducing the delivery chain. The New retail model not only engages with customers through the delivery system, but also allows purchases in stores and provides services such as ingredient processing and catering.

In terms of cost, the platform-based model is mainly distribution cost, while the New retail model is mainly procurement cost and investment cost of physical stores. The cost structure of the Frontal warehouse model can be seen as a combination of the first two models. Its main costs are both the renting and investment costs of warehouses, as well as the procurement costs of food and the distribution costs of the end. This is one of the pain points of all Frontal warehouse model enterprises at present. It is important to point out, however, that while the Frontal warehouse meets peak distribution and storage requirements during peak evening hours, it leads to inefficiency in the morning and afternoon, and the high fulfillment cost is the main reason why Frontal warehouse companies are still not profitable. Among the four models, the Frontal warehouse model has the highest proportion of technology investment, the other three models of IT system investment is mainly the upgrade and maintenance of the online platform.

In terms of revenue, unlike the other three models, the platform-based model's revenue is not generated through the sale of goods, but mainly through the collection of commissions from merchants and shipping fees paid by customers. Of the remaining three models, both the New retail and Frontal warehouse models have expanded their revenue streams through their own brands and other businesses such as opening physical stores, while community group buying currently only generates revenue through online sales of products.

In terms of core resources, both the inventory-based Frontal warehouse and the New retail model take the establishment of an intelligent cold chain logistics system as their core resources. On the one hand, by making the transportation process intelligent and digital, the status of transported and stored food is tracked in real time. Through the government platform, a traceability system is established. On the

other hand, by building an intelligent warehouse, the efficiency of warehouse operation is improved and unmanned warehouse management is realized. In addition to this, the Frontal warehouse also uses a constantly optimized demand forecasting model as the basis for procurement, accomplishing high daily volume, high precision procurement and replenishment quantities for each Frontal warehouse, while the New retail is centered on an extensive physical store layout and membership base to ensure daily sales. The main business of the platform-based model is to build an information, capital, commodity, and logistics platform between upstream merchants and downstream consumers and to keep the flow of these aspects smooth. Community group buying is primarily focused on low-cost operation through a pre-sale system and self-pickup last mile, as well as meeting customers' daily needs while avoiding the long-tail effect.

Except for the platform-based model, the other three models use upstream farmers, plantation bases, agricultural cooperatives and other suppliers as key partners. This strengthens cooperation with suppliers by providing capital, data, and technology to improve the security and stability of the supply chain. In terms of downstream distribution, the platform-based model and the New retail model use third-party logistics to reduce the investment in related fixed assets.

In terms of promotion channels, except for the New retail model, the other three models focus on online promotion, with the community group buying and Frontal warehouse models mainly spreading on social media such as WeChat, which has a large number of Chinese users, with content including soliciting new customers and product special promotions. In order to better reach young people, the platform-based model not only branches out on social media, but also promotes through short video platforms such as Tiktok. The New retail model attracts customers mainly through product marketing in physical stores, price marketing, and weekend specials.

4.2.2. How are the sustainable performances of each BM and why

Table 21: Four food e-commerce business model's performance in sustainability

	Dingdong *(Frontal warehouse)*	**Yonghui** *(New retail)*	**Shixing Fresh** *(Community group buying)*	**Meituan** *(Platform-based)*
Economic				

Cost	"The operating cost is too high, because of the rental cost and the labor cost of sorting and distribution"	"Excessive investment to add online channels in the transition to new retail"	"Compared with other food e-commerce companies, it is undoubtedly very advantageous"	"The platform-based model has an inherent advantage in cost compared with other food e-commerce"
Profitability	"The company has not yet reached the break-even point"	Poor profitability	"Profitability is one of the best in the whole fresh food e-commerce industry"	"The platform-based model has the potential and ability to make long-term sustainable profits"
Food wasty	"Demand forecast and focus on product freshness; overall food loss rate is still high"	"Food loss rate is much lower than other supermarkets"	"Make full use of pre-ordering and greatly reduces the loss and waste of food"	"Have a range of initiatives to reduce food waste with good results"
Social				
Food safety	"Won the Food E-commerce Experience Champions by high standards of food quality"	"Food safety have been greatly improved and the one-time rapid inspection pass rate has steadily increased"	"Self-built traceability system guarantees the safety and quality of food to the greatest extent"	"The standardization of food merchants and the level of food safety in Meituan have been continuously improved"
Social welfare	"Won the honor of Corporate Social Responsibility Standard Enterprise"	"Has successively won national, provincial, and municipal awards for its	"The public welfare activities have won the national-level	"Has made many important contributions to social welfare"

		social welfare performance"	typical case awards"	
Labor right	"Policies on labor rights and interests are very comprehensive"	"Welfare policy for employees is very perfect"	"With very comprehensive actions"	"The basic legal rights and interests of workers, are not sufficiently protected for couriers"
Contractual stakeholder's influence	"Helps upstream suppliers by supporting, providing technical support and expanding sales channels"	"Help backward areas become self-reliant and broaden the road to revitalization with rural characteristics"	"Realize a healthier development of agriculture, and give more scientific guidance to farmers"	"Targeted assistance has effectively helped all merchants achieve better online and offline operations"
Environmental				
Air emission	"Reduce net greenhouse gas emissions during production by requiring farmers to adopt green farming practices"	"Focus more on environmental protection, reducing energy consumption in operation and realizing emission reduction"	"Achieved noteworthy results" by optimizing operations and distribution	"Achieved the goal and expectations of energy saving and emission reduction"
Package material used	"Did not comply with the restriction on the use of non-degradable and	"Actively respond to the plastic restriction policy of the government, and have been	Only mentioned that the plastic packaging bags can be reused as garbage bags	"The remarkable results achieved by the Green Mountain

	disposable plastic products"	well received by the public"		Project since its inception"

In terms of cost, the platform-based model and the community group buying model are both operated in asset-light models with relatively low fixed and operating costs, with no warehouses and no self-operated offline stores, resulting in excellent cost performance. The Frontal warehouse model requires the establishment of offline warehouses in core urban areas close to residential areas, with high warehouse rental costs. At the same time, the labor cost of packing and point-to-point delivery of each order is also very high. Because of these characteristics of the business model, the Frontal warehouse model has a very high operating cost. Based on the original offline sales stores, the New retail model invests a lot to coordinate and optimize in order to realize the transformation and upgrade of joint offline and online operations, which leads to bad cost performance.

In terms of profitability, the companies representing the community group buying model and the platform-based model have achieved continuous profitability for several years, with strong profit potential. The companies that represent the New retail model have initially been above the break-even point. However, the impact of online sale transformation has led to poor profitability. It is unknown whether they will be able to achieve sustainable profit performance in the future. The Frontal warehouse model is still in a loss-making situation so far due to the drag of high operating costs.

When considering food wasty, the platform-based model and the community group buying model are not burdened by inventory and are able to achieve a rapid flow of goods with a low loss rate of the commodity. Additionally, these two models optimize the delivery process, further reducing food waste to reach remarkable performance on the food wasty metric. The New retail model is able to take advantage of offline store sales by processing and discounting food that is about to expire. As a result of these initiatives, unsold stock can be disposed of quickly in a timely manner, thereby greatly reducing food waste. The Frontal warehouse model operates based on forecasting customer demand, while the company actively discards food that is not fresh in order to protect the quality of the product sold. This leads to an extremely high rate of loss and the problem of food waste is difficult to fundamentally improve and solve.

When comparing the sustainability of the four business models under the dimension of social, it is clear that food e-commerce business models are generally better able to assume their corporate social responsibilities and obligations in all

aspects. In terms of food safety, each business model has taken some strong initiatives to strive for food quality and safety thus achieving a marked improvement over the initial stage of food e-commerce. In terms of social welfare, the overall performance of each food e-commerce business model is very positive. In addition to organizing many public welfare activities and projects, they also call on their partners to help the socially disadvantaged. Some of them have received government awards and recognition in this area, demonstrating their contribution to the general welfare of society. In terms of labor rights, the other three business models have comprehensive plans and good performance in the protection of basic employee rights and interests, skills training, and career development. However, the platform-based model is considered to be negative in terms of employee rights and benefits. This is because it did not take corresponding obligations to the basic rights and protection of employees as stipulated by the government, including reasonable working hours, work intensity, pension insurance and medical insurance. In terms of contractual stakeholder's impact, all four food e-commerce business models support the whole supply chain to achieve better development and progress through initiatives that help them to better produce and operate.

In terms of air emission, all four business models have responded proactively to national policy requirements and incorporated energy saving and emission reduction requirements into their company strategies. They have taken many effective initiatives in various aspects and have achieved good results in reducing air emissions.

In the use of package material used, the New retail model and the platform-based model reduce the use of plastic packaging and the impact on the environment caused by plastic packaging through process design and the use of environmentally friendly packaging materials. Their performance on this metric has been recognized by the community. The community group buying model only mentions that plastic packaging can be reused, without more effective measures, and its performance in this metric is relatively average. For the Frontal warehouse model, no measures are taken to reduce the environmental impact of packaging. Even upstream suppliers and disposal processes are allowed to use plastic packaging freely Therefore, it has been penalized for doing so by the government.

4.2.3. How does each BM affected differently by the COVID-19

After interviewing food e-commerce companies of different business models, this thesis obtains the impact of the Covid epidemic on operations from different business model perspectives, as well as the companies' response strategies. These are presented in the table below.

Table 22: Four food e-commerce business models in COVID-19

	Effects of Covid	**Ad-hoc practices**
Dingdong ***(Frontal warehouse)***	To business sales plummeted	Adjustment of assessment systems for outsourced logistics companies
Yonghui ***(New retail)***	The supply side is unstable, and the goods cannot be delivered in time	Cooperate with the government to obtain qualified epidemic prevention and control communities for distribution
	Sales slump due to lack of supply and coronavirus lockdowns	Develop a community group purchase model
	Insufficient staff in services such as distribution and sorting	Provide raw materials for catering services for epidemic prevention-related personnel
Shixing Fresh ***(Community group buying***	The supply side is unstable, and the goods cannot be delivered in time	Add some flexible suppliers and third-party delivery capacity Comprehensively analyze the actual situation and the company's capabilities to analyze whether the company's transportation and distribution capabilities need to be adjusted
	Demand is volatile	
Meituan ***(Platform-based)***	supply-side expansion	Actively respond to opportunities and provide upstream merchants with commission reduction and operation butler services
	Delivery staff unable to meet delivery demand	Delivery by unmanned vehicles and drones

According to the table above, interviewees mentioned different impacts of the epidemic on different business models, but they can be broadly summarized into

three main categories: changes on the supply side, changes on the demand side, and manpower shortage issues.

According to interviews, the majority of food e-commerce business models are negatively impacted on the supply side. The supply chain had problems "due to the government's regional blockade policy, and the required goods could not be delivered in time, resulting in a shortage of supply". Only the platform-based model is unique and its supply side was expanded during the epidemic. This is due to the fact the upstream suppliers of the platform-based model are mainly offline restaurants. As a typical people-intensive industry, "they were restricted from deploying offline catering services during the epidemic". The online food delivery provided by the platform-based model "became the only source of revenue" for many food merchants whose main revenues used to be highly dependent on offline traffic.

The causes and results of changes on the demand side of each food e-commerce business model are relatively inconsistent. The community group buying model "has fewer offline physical operations and is less affected by community closure policies" in cities with severe epidemics. Therefore, the main problem faced by the community group buying model on the demand side is that people's consumption habits changed during the epidemic. This was from a stable daily demand before the epidemic to a regular stockpiling demand after the epidemic happened. This change led to greater fluctuations on the demand side, making it difficult for companies to allocate and plan capacity. For the Frontal warehouse model, the negative change on the demand side was mainly the decline in sales volume. Although the Frontal warehouse model also has fewer offline operations, with only distribution and warehousing that do not have direct contact with consumers, the fact that "part of the model's customer base is To Businesses segment, i.e., restaurants that were subject to strict offline operational controls during the epidemic, led to a significant decline in sales and merchandise demand" for the Frontal warehouse model. Also negatively affected was the New retail model. But the impact factor on the demand side of New retail came mainly from its own offline business. Due to a combination of factors including lower quality of merchandise supply, restrictions on offline travel by residents, and fears of crowds gathering to catch the COVID-19, the offline business of the New retail model saw a significant decrease in revenue during the outbreak.

Labor storage and understaffing are also common problems faced by the food e-commerce industry during the epidemic. Most food e-commerce businesses are involved in labor-intensive offline processes such as distribution and sorting, and

most of the employees in charge of these positions in first-tier cities are migrant workers. These employees find "it difficult to travel to big cities due to traffic control where their hometowns are located or are blocked from their residences in first-tier cities", resulting in a lack of labor for companies and affecting fulfillment capabilities. Respondents from both the platform-based model and the New retail model mentioned this issue.

After comparing the contents of the table, it is easy to find that different models respond differently when facing the impact of the COVID-19 epidemic due to different influencing factors. Facing problems such as supply chain disruptions on the supply side, the community group buying model and the New retail model have relatively the same countermeasures. By analyzing the company's supply situation and increasing flexible transportation capacity and proximity to suppliers, they alleviate the supply shortage due to the epidemic and provide consumers with a good shopping experience on a continuous basis. The platform-based model, on the other hand, "seizes this supply-side expansion opportunity to support new entrants and existing merchants, including commission waivers during the epidemic and butler services to provide operational guidance".

In the face of fluctuating changes on the demand side, the community group buying model chooses to allocate additional flexible outsourced transportation capacity according to the specific situation. This is to "meet customer demand without massively expanding the company's own capacity". The Frontal warehouse model, on the other hand, takes multiple measures to eliminate the impact of the loss of business-end customers on the company's sales and inventory. First, for the existing To Customers segment, in order to better serve them, the Frontal warehouse model reached an agreement with the government to obtain the qualification of being able to enter the residential communities for distribution. At the same time, the Frontal warehouse model also launched a group community buying for the blocked communities, which can "quickly consume the company's excess inventory on the one hand and ensure people's livelihood while increasing sales on the other". Secondly, "in order to make up for the lack of the To Businesses segment", the Frontal warehouse company reached an agreement with some institutions that need epidemic-proof meals and quarantine meals to provide them with catering raw materials. The reasons for the decline in the demand side of the New retail model are more diverse, so companies in the New retail model address different reasons to "better serve consumers and increase their willingness to buy" by accelerating the renewal iteration of goods whose dates are not fresh, strengthening delivery services and employee self-testing to ensure no risk of infection.

When it comes to the labor problem, the platform-based model and the New retail model have chosen very different solutions. Because the labor shortage only affects the delivery chain, the platform-based model rigorously develops, pilots, and promotes the use of unmanned delivery vehicles and drones. This replaces manual transportation with machine transportation. The New retail model involves more processes that require human resources and is more flexible, making it difficult to meet the needs of enterprises through robots. The New retail mode relies on methods such as shared labor and multiple-skill labor to solve this problem. Shared labor means that the New retail model cooperates with supermarkets that have the same operation processes and procedures (Zhan and Cai, 2021). When the staff is insufficient in the New retail companies, the staff can be seconded from the supermarket to complete the process. Multiple-skill labor means that the New retail model trains employees in the store and requires them to have the ability to work for different positions to a minimum extent (Wang 2008). If there is a shortage of staff in other positions, these employees can be rotated according to schedule.

4.3. Result discussion

4.3.1. Community group buying

The company interviewed under the community group buying model is Shixing Fresh. It differs in some aspects of the business model from companies such as Duoduo Maicai, Meituan Youxuuan, and Taocaicai, which also belong to the community group buying model. As a result of its regional business development, it is not a nationally known company, resulting in relatively limited literature on its business model. Consequently, the thesis differs from some extant studies in its description of the business model. Each of the differences will be explained next.

Firstly, the strategy of Shixing Fresh is to deeply cultivate and attract high-net-worth users between 30-45 years old in first- and second-tier cities. This is different from many community group buying companies' development strategy of spreading nationwide and focusing on the sinking market. So the findings of this thesis in terms of customer segments are quite different from the findings of the existing literature. Li (2021) states the customer groups of community group buying companies are mainly young people born in the 1980s and 1990s with relatively high educational levels, while Cao (2021) believes the age of community group buying consumers is distributed from 26 to 60 years old and seeks cost-effective. Meanwhile, in terms of geographical location, second-, third- and fourth-tier cities are currently the main battlefields for most community group buying companies (Fan et al. 2022).

Furthermore, Shixing Fresh does not have a position for group leader, a key partner responsible for promotion, sales, and self-pickup processes. Shixing Fresh has transferred the task of promotion and sales from the group leaders to the company APP and WeChat mini program while adopting refrigerated self-pickup cabinets to replace the self-pickup service managed by the group leaders. Refrigerated self-pickup cabinets can send messages to remind customers to pick up their food when it arrives (Tian 2022). Other community group buying companies usually contract with the owners of existing stores in the community to become the group leaders and turn the stores into self-pickup points. The group leaders rely on their own social connections to establish a WeChat group for promoting products so that the company can quickly enter the community market and accurately grasp the consumption needs of community consumers, which can achieve targeted conversion, increase the penetration speed, and expand the market (Shi 2021). Commissions will be paid to the group leaders by the company based on sales (Fan et al. 2022).

Finally, in terms of the company's key resources, Shixing Fresh is a food e-commerce company that has grown up relying on government endorsement (Lu, 2018; Liu 2015). In contrast, many other community group buying companies rely on large Internet companies as their parent companies for development. For these companies, parent companies are very critical resources for community group buying companies. They are able to provide a lot of resources and competitiveness to community group buying companies (Hong 2021; Wu and Liu 2021; Zhang 2021). In the early stage of development, the community group buying companies were piloted and expanded through small retail stores and community sales outlets originally owned by the parent companies. Some store managers would become the first batch of group leaders. In the later stages of development, with the offer of capital, operation, traffic, supply chain, and store management experience from parent companies, community group buying platforms can have relatively complete and favorable core competitiveness and stand out in fierce competition (Xiong et al. 2022).

In discussing the sustainability performance of the community group buying model, the currently extant literature is consistent with the findings of the thesis in three areas: cost, food wasty, and contractual stakeholder's influence. The existing literature and studies confirm that the community group buying model relies on some operational attributes of the model itself, such as the pre-order model and last-mile self-pickup logistics. Therefore, it has a definite advantage over other food e-commerce business models such as the Frontal warehouse model and the New retail model in terms of procurement, logistics, storage, and loss costs (Fan et al. 2022; Cao 2021; Wu 201). At the same time, these attributes can also effectively help community group buying companies to achieve high-speed flow and reduce the loss of food in the supply chain (Li and Sun 2020; Cao 2021; Zhou 2022; Yang 2021). As for the performance of contractual stakeholder's influence, community group buying takes advantage of its own model and direct connection with the origin and applies social e-commerce to open up the industrial chain of agricultural products to create a new type of agriculture (Dong 2019; Wang and Wang, 2021) and realize helping farmers to alleviate poverty (Yu et al. 2021).

The interviewees of the community group buying model in the thesis, Shixing Fresh, have been consistently profitable since 2019. However, according to the existing literature and financial reports of listed companies, it is known that different community group buying companies currently vary in their performance of profitability, but most of them are still in a continuous loss (Wu 2021; Tan 2021). The top three community group buying companies in China in terms of sales are Meituan Youxuan, Duoduo Maicai and Taocaicai. According to Meituan Group's financial report, "New Business and Others", which includes community group

buying, lost 38.4 billion yuan and is still in a continuous loss. Duoduo Maicai lost 1 billion yuan and 3 billion yuan in the first and second quarters of the fiscal year 2021. Alibaba Group's financial report also showed a significant decline in total net profit due to the increased investment in the submerged market business of Taocaicai. Based on the above information, the thesis argues that the entire community group buying model is actually still in a structural loss state. As it is still in the early business spreading stage, companies need a lot of subsidized funds in the hope of attracting and retaining consumers with low prices and occupying market share. Instead, Shixing Fresh is an anomaly in community group buying. It adopts a steady and deep cultivation strategy and uses good service quality as its core competitive advantage. It avoids using subsidized ultra-low prices as a means to attract consumers.

There is a lack of literature giving direct comments on the community group buying model in terms of food safety performance, but some literature makes indirect references to the food safety risks of the community group buying model due to the lack of professional training of the head of the group and the inability of the self-pickup point environment to meet professional food storage requirements (Gu 2021). The research and literature on labor rights and interests of community group buying companies mainly focus on the development and training of group leaders (Wu 2019; Shi 2021; Cui and Huang 2021), and less attention is paid to other internal employee support and skills training. With regard to the sustainability performance of air emissions, only a few thesiss explore how the community group buying model should reduce emission pollution in terms of distribution center location and distribution route planning (Sang 2021). There is little extant literature and research on the use of packaging materials for community group buying, and attention has focused on the use of different packaging materials and techniques for different products to reduce wastage (Chen and Liu 2021). There is no discussion on the sustainability performance of packaging such as degradability and reduction of use.

In the responses on how Shixing Fresh was affected by the COVID-19, the interviewee mentioned the impact of national policies on both the supply side and the demand side. The extant literature studying the impact of the epidemic on the community group buying model also suggested that the supply side and the consumption side were affected by the epidemic (Ding and Zhang 2022; Shi et al. 2020). The impact on the supply side is mainly due to the shortage of production and untimely distribution caused by the difficulty of staff and upstream suppliers to resume work and production. The impact on the demand side is mainly due to the change in consumer habits affected by the epidemic. These findings are consistent with the findings in this thesis. The literature also mentions the important role of group leaders in the aftermath of the epidemic. The literature argues that the

group leaders need to complete the end logistics of the community group purchase. They have to rationalize the flow of people, rank the risk of cross-infection of the epidemic, and do a good job of disinfection and protection to ensure the safety of the end logistics (Ding and Zhang 2022; Shi et al. 2020). The results of this study were not mentioned in the interview or in the findings of the thesis because there was no group leader position in Shixing Fresh. There is also literature investigating the determinants of community group buying as a substitute for offline shopping during the epidemic, an area not covered in the thesis. The results of that study showed that the frequency and amount of community group buying were mainly influenced by epidemic prevention policy, household income and size, home ownership, transportation ownership, and community group buying experience (He et al. 2022).

In addition, there is a lack of literature on the study of how the community group buying model responds to the impact caused by the COVID-19. No relevant research findings or topics were found.

4.3.2. Platform-based

The current market of the platform-based model is oligopolistic, with the only two companies being Meituan and Ele.me. At the same time, the platform-based model is simple to operate. Consequently, the operational strategies and initiatives of the two companies in the platform-based model are highly consistent. Therefore, the conclusions obtained in the business model description section of this thesis are highly aligned with the results of the currently available studies and literature (Sun and Kong 2016; Zhang 2016; Jia et al. 2019; Hou 2017; Bai and Liu 2022).

The findings of the thesis are consistent with the existing literature on the performance of the community group buying model in terms of cost, profitability, package material used, social welfare, contractual stakeholder's influence and labor.

Available literature and studies on the platform model agree that the asset-light operation of the platform model is effective in helping companies significantly reduce costs and optimize their cost structure (Wang 2018; Jiang and Xie 2015). Also, the literature states that in order to cope with high delivery costs, the platform model chooses to outsource delivery needs and use crowdsourced logistics (Ding 2018; Sima 2019). According to the extant literature and company financial reports, the two companies in the platform model-Meituan and E.leme-have already passed the period of deficit and are in a period of rising profitability, with greater subsequent profitability and potential (Jiang et al. 2022; Li 2019; Li 2020). Meituan's initiatives to reduce the environmental impact of plastic packaging and disposable tableware are collectively known as the Green Mountain Project. Another company

in the platform model, Ele.me, has a similar environmental program, named the Blue Planet Project. The contribution of the Green Mountain Project and the Blue Planet Project in reducing the use of plastic packaging and disposable tableware is also well documented (Hou 2019; Zhang et al. 2019). Studies and literature have consistently praised the two companies in the platform-based models for actively participating in social welfare activities, integrating public welfare into the company's development strategy and corporate culture, and fully promoting corporate responsibility (Yu 2021; Wen 2020; Yao 2019). When exploring the contractual stakeholder's influence, there is academic consensus that platform-based companies effectively help upstream food merchants achieve better growth and profitability by providing them with training and support (Ji et al. 2022). Considering the rights and interests of employees, the existing studies suggest that the platform-based companies have violated the basic labor rights and interests of employees while achieving flexible employment and reducing costs by outsourcing (Guo 2022; Chen 2020; Zhao 2021).

There is a lack of literature and research on platform-based models for food wasty and air emission. No relevant conclusions were found.

In interviews, interviewees from Meituan said that with the implementation of relevant initiatives to safeguard food safety. Food safety problems in Meituan have been effectively improved. However, based on the currently available literature and research materials, the thesis found that the food safety of the platform-based model still has great risks. The related food safety problems occur at high frequencies (He 2021; Wang et al. 2020; Wang 2019). Compared with the food safety supervision in the traditional foodservice industry and other food e-commerce business models, the food safety supervision in the platform model has more specificity and complexity. It is difficult to achieve all-round and whole-process effective supervision due to the unclear responsibility and power of who performs the supervision as the responsible subject (Hu et al. 2016).

These findings differ from the conclusions reached through the interview previously conducted. The thesis argues that the main reason for this matter is the different perspectives of observation. The platform-based companies have explored this issue in comparison to the situation at the beginning of their establishment and conclude that the food quality and safety situation has improved. Literature and consumers, however, are analyzed in the context of current realities. The fact that safety issues are still occurring with platform-based companies such as Meituan suggests that the platform model is not performing as well as it should in terms of food safety.

When talking about how the platform-based model were affected by the epidemic, the interviewee from Meituan indicated that the main impact was concentrated on the supply side and the delivery process, which is congruent with the findings of the extant literature. The epidemic provides a good opportunity for the supply side to thrive (Liu and Li 2020; Li 2020). On the distribution side, it is clear that the platform-based model has experienced a shortage of distribution capacity due to the impact of the epidemic blockade policy (Zhu 2020). In terms of response strategies, the literature mainly mentions the piloting and rise of unmanned just-in-time delivery such as unmanned vehicles and drones (Liu 2020). There is no literature on some internal operational strategies and information, such as initiatives to reform the evaluation system of logistics contractors.

4.3.3. Frontal warehouse

Although Dingdong and Daily Fresh are two of the most representative companies in the front-end warehouse model, a comparison of literature shows that there are still subtle differences between the two companies. After going public, Dingdong has made a push to build commodity power. On the one hand, Dingdong has increased direct sourcing from the fields; on the other hand, Dingdong is also building its own brands and already has 10 of its own production and processing plants, including a cereal processing plant, a pork processing plant, and a 3R processing plant. Unlike Dingdong, which continues to lay out asset-heavy development, Daily Fresh is serving the C-sides while also offering services to the B-sides. Daily Fresh has proposed a strategy to develop Smart Farms and The Retail Clouds (Zheng 2022). The Smart Farm is to provide a complete SaaS (Software as a service) service package for merchants, improve the digitalization of vegetable farms, and help merchants develop online e-commerce channels, etc. to promote the digital upgrade of agricultural markets. The Retail Cloud business, which aims to provide digital support based on intelligent retail networks to small and medium-sized supermarkets in the community retail long-tail market, is profitable through the rent charged to merchants. At the same time, Daily Fresh is reducing its asset-heavy footprint by drastically cutting back on front-end warehouses, from 1,500 at its peak to 625 today. In terms of other business factors, Dingdong is the same as other front-end warehouse models, so this thesis won't go into them here.

According to the literature, Dingdong performs similarly to other front-end warehousing companies in terms of cost, food safety, attrition rate, and contractual stakeholder's influence. In terms of cost, Dingdong has high operational and labor costs (Teng 2021). In terms of food safety, Dingdong uses a strict testing system to sample the food it purchases, and Dingdong outperforms other front-end warehouses in this regard (Xing 2019, p85-87). Most front-end warehouse

companies improve operational efficiency by building smart warehouses and developing cold chain transportation technologies to reduce food loss rates. Furthermore, Daily Fresh also adopts a selective SKU model to reduce the average product turnover days and reduce loss rates (Huang 2022). In regards to contractual stakeholder influence, Dingdong is the same as other front warehousing companies, using technology and capital to support suppliers to influence upstream and to strengthen the stability of their own supply chain (Xing 2020).

In terms of profitability, Dingdong has outperformed other front-end warehousing companies. As mentioned earlier, Dingdong has not only increased its revenue through online product sales, but also developed other businesses such as pre-made dishes and private brands, and has surpassed Daily Fresh in some core metrics (GMV, average daily orders, number of users, cities covered), while Daily Fresh has suspended its "30-minute delivery" service in July 2022 due to a single profit model that cannot cover the high delivery costs, and replaced it with next-day delivery similar to community group buying (Yang 2022).

The review revealed that the existing literature lacks the performance of front-end warehouse companies in terms of social welfare, employee rights, and packaging material use. In terms of air emissions, there are some articles on front-end warehouse siting optimization through demand forecasting (Dong 2020) and front-end warehouse siting through multi-objective modeling (Heng 2019). In the distribution process, air emissions can be reduced by optimizing the location of the Frontal warehouse.

Most of the current information on the impact of front-end warehouse companies during the epidemic is positive, with a shift in consumer habits from offline to online (Yuan 2021) and a surge in demand for short-radius, just-in-time delivery front-end warehouse models during the epidemic due to avoidance of crowd gathering and strict travel restrictions in some neighborhoods (Dong 2021 p12-14). The literature does not mention that during the epidemic, the Frontal warehouse companies suffered from transportation difficulties due to controls, as mentioned in this thesis.

4.3.4. New retail

In terms of target customers, another representative of New retail model, Hema Fresh, is mainly aimed at high-end consumers in first-tier cities, who demand high quality and freshness of fresh ingredients, but are less sensitive to price changes and are happy to try fresh ways to enjoy life, while Hema Fresh stores have new and high-grade ingredients and a product range close to that of imported food supermarkets, echoing their needs (Wang 2020). In terms of revenue and costs,

Yonghui's stores are more likely to have a higher quality of food than other stores. In terms of revenue and costs, Yonghui is similar to other New retail models companies in that it relies on online and offline merchandise sales and private brands. It also relies on food processing and cooking fees, as well as franchise fees. New retail model companies are all asset-heavy models, with store investment costs and operation and management costs accounting for a large proportion of cost expenditures (Chen 2018). In terms of core resources and processes, Hema Fresh is the same as Yonghui. It focuses on channel expansion of the supply chain and building its own intelligent cold chain logistics system to reduce the food loss rate. In addition to this, Hema Fresh also focuses on improving in-store efficiency. Hema Fresh adopts a fully automated distribution model within its stores, with the time spent from order taking to product boxing being only about 10 minutes. Products are driven by fully automated logistics from in-store pickup to post-store packaging, while Hema Fresh uses electronic tags to mark product prices. With the use of electronic tags, the prices of products are updated by store staff in the background, thus realizing instant price changes between the online terminal APP and the product prices in the physical stores (Hong 2019). Unlike Yonghui, the key partner of Hema Fresh is a member of Alibaba Group. Alibaba can provide technical and financial support to Hema Fresh, while Alibaba's brand resources and human resources provide a constant stream of customers for Hema Fresh (Li 2020).

In terms of sustainable performance, Yonghui's performance in terms of cost, food waste, food safety, and contractual stakeholder's influence is the same as other New retail model companies. In terms of cost, New retail companies generally have higher capital investment in the early stage, costing around 30 million yuan; secondly, stores occupy a large area, generally requiring 4,000-6,000 square meters of space in shopping malls, and also need to be equipped with daily processing equipment such as water, electricity, gas, and smoke exhaust. A New retail store needs to open in an area of 200,000 people to sustain its daily operations (Sun 2022). In terms of food waste, New retail model companies perform better than other traditional supermarkets because they can not only sell goods online and offline, but also increase the expiration date of food through secondary processing of goods through in-store catering and processing operations. They can also sell food products at low prices through online and offline promotional campaigns (Huang 2019 p26-29.). In terms of food safety, Hema Fresh uses QR code traceability technology to ensure information-based food safety tracking throughout the entire process. During the shopping process, consumers can easily check the production base of food, the production inspection report and the whole "picking-packing-transportation" process information by using QR codes (Jiang 2021). In terms of contractual stakeholder's influence, Hema Fresh also adopts the model of connecting farmers or cooperatives with supermarkets, providing sales plans and

helping farmers to set planting standards, so that farmers can plant on a large scale and with a plan, which protects the interests of farmers and reduces the loss of agricultural products in circulation. Bringing higher returns to farmers (Xu 2019)

In terms of profitability, Yonghui's profitability is not as good as that of Hema Fresh, which is built on a data-driven model. Relying on Alibaba's technologies such as big data and cloud computing, Hema Fresh relies on the Hema Fresh APP and Taobao customer information to analyze demand preferences and pinpoint high-quality users, so Hema Fresh's merchandise gross margins are higher than Yonghui (Zhang 2021). There is a lack of general descriptions of the performance of New retail companies in terms of social welfare, labor rights, air emissions and package material used. In terms of Air emission performance, only a few literatures reduce carbon emissions by describing the provision of growing standards to farmers to guide them to grow organic vegetables and reduce chemical fertilizer use (Xu 2019).

The literature on the impact of New retail businesses during the COVID-19 is similar to the conclusions reached in this thesis. These three aspects can be summarized in three main ways. First, the online demand has increased significantly. During the epidemic, many people are not convenient to go out and have a higher risk. As fresh food is a necessity, the demand for home delivery service increased greatly. Second, shortage of goods and untimely supply. During the epidemic, many places were under closed control and there was an extreme shortage of commodities, some of which could not be transported to the local area properly. The demand on the Internet increased greatly, resulting in a shortage of inventory and unstable supply. Third, shortage of manpower and low efficiency of logistics and distribution. During the epidemic, the shortage of manpower and the surge of online orders greatly affected the efficiency of distribution (Zhu 2021

5. Conclusion

The literature review in the first part of this thesis revealed numerous research gaps in the field of food e-commerce research in China. There is a need to investigate and explore the business model characteristics, sustainability performance, and the impact of the Covid epidemic on Chinese food e-commerce. The current works focus on the analysis of the current situation and problems of a single food e-commerce enterprise. Model comparisons, sustainability performance, and epidemiological aspects remain to be fully explored. To bridge this gap, case studies have been conducted with a sample of different food e-commerce companies to explore the topic empirically. The study was guided by the following research questions.

- **RQ1**: What are the existing food e-commerce business models in the Chinese market, and what are their characteristics?
- **RQ2**: How do food e-commerce BMs affect sustainability performance?
- **RQ3**: How has COVID-19 affected the food e-commerce industry and what practices has been taken by companies in the food e-commerce industry in reaction?

Starting from the data gathered during interviews, results have been re-elaborated in the within-case and cross-case analysis. The thesis summarizes the four business models of food e-commerce in the Chinese market: community group buying model, platform-based business model, Frontal warehouse model, and New retail model. Taking the Business Model Framework as a reference, the thesis provides a detailed description and comparison of these four business models in terms of five aspects: value proposition, value delivery, value capture, value creation, and value communication. Based on the triple bottom line framework, the thesis analyzes and evaluates the sustainability performance of the four food e-commerce business models in terms of three dimensions and nine metrics. In the thesis, it is demonstrated that the economic performance of different food e-commerce business models varies. In the social dimension, food e-commerce generally performed well. In the environmental dimension, the four food e-commerce business models can effectively achieve energy saving and emission reduction, but the performance in terms of package material used is uneven. Finally, when analyzing the impact of the COVID-19, it can be concluded that the impact of the epidemic is approximately from the same aspects for all business models: changing capacity on the supply side, greater volatility on the demand side, and labor

shortage. However, due to the different causes, the response strategies of each model and company are different.

Existing research lacks a complete summary of the business models of Chinese food e-commerce firms and lacks a focus on sustainable development, with only a few thesis examining the performance of food e-commerce firms in economic terms and few studies on the social and environmental aspects of sustainable directions. For the 2019 outbreak of the COVID-19, there is also a lack of literature summarizing the impact of this epidemic on different food e-commerce business models. In response to these literature gaps, this study summarizes four food e-commerce business models by categorizing the operational models of fresh food enterprises currently existing in China and analyzes the characteristics of each food e-commerce business model using a case study approach, and describes the characteristics of each business model by comparing the business models of different food e-commerce companies. It can help companies currently in the fresh food e-commerce industry to better understand the current modes of operation. This thesis also obtains the initiatives of each food e-commerce company through interviews and analyzes the performance of these initiatives in the direction of corporate sustainability, and summarizes the similarities and differences in the sustainability performance of each food e-commerce business model in cross case study, which can help companies refer to the impact of different practices on sustainability aspects in the case study, learn from the measures that have a positive impact on the company, and make improvements. This thesis also summarizes the different degrees of impact on food e-commerce companies in the face of the COVID-19 and the ad-hoc practices taken. By drawing on the cases in this thesis, practitioners may be able to respond to similar external challenges.

However, there are some limitations in the research process of the thesis. First, this thesis utilizes a Case Study methodology in which information is obtained through interviews. Due to certain conditions, the number of cases and individuals interviewed in this thesis is relatively small. Each model has only one complete interview and some scattered supplementary interviews. The sample size is too small, resulting in a lack of certain accuracy in the final conclusions and research results. Secondly, the research method of the thesis is qualitative research and lacks intuitive quantitative data for evaluating sustainability performance, resulting in poor comparability of the final conclusion. Ultimately, this thesis only interviewed and explored food e-commerce companies in the Chinese market and failed to further investigate food e-commerce business models outside of China. This situation leads to the findings of this thesis having geographical characteristics and attributes that are not necessarily applicable globally.

The future research path should include more interviewees in order to provide a more detailed elaboration of the characteristics and sustainability of food e-commerce business models based on a more variety of data sources. A quantitative research approach should also be adopted to quantify and compare the sustainable performance of companies. At the same time, future research directions should also explore the operational level, providing recommendations on measures to increase the strengths and compensate for the weaknesses of the different characteristics of the business model, and providing recommendations on sustainable measures to improve the overall sustainable performance of the company.

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A. Appendix A

This section presents the following listed document:

- Interview Questionnaire

1. Please briefly explain your role in the organization

BMs for food e-commerce

2. Please briefly explain the business model of your company

- Who are your target customers? What are the main needs of your customers?
- How do you satisfy your customers' need?
- How does your supply chain operate and what are your distribution channels?
- What are your main competitive priorities? And how do your practices support them?
- What is the core competitive advantages of your company?
- How is the cost structure of your company? And what are your main revenue streams?
- How does the whole supply chain work?
- How does the company operate marketing and promotion?
- What and how do you communicate to your customers?

3. Why do you choose to operative with the above-mentioned business model?

- How would you comment on its advantages?
- How would you comment on its disadvantages?
- What are the major challenges operating with this business model?

Food e-commerce BMs and sustainability

4. Please comment on the impact of your business model on environmental performances?

- Do you consider carbon emissions in the product life cycle? (Add and recommend organic vegetables that do not use pesticides and fertilizers in product categories, energy consumption during food processing, optimization of vehicle .distribution path planning, etc.)
- Do you have any initiatives to reduce environmental pollution in food packaging? (over package, use of recyclable/biodegradable materials, availability of labels to enhance how packaging is sorted for waste, any relevant technology patents or measures to stay ahead of competitors, etc.)

5. Please comment on the impact of your business model on social performances

- How do you practice food quality control and how is the performance?
- Do you consider/evaluate food safety?

- How do you manage the relationship with upstream and downstream partners?
- What impact do you have on the upstream and downstream respectively, and how does each work?
- Do you have initiatives related to employee rights? If yes, what and how? (Employee insurance, career planning guidance, necessary vocational skills training, fair salary and benefits policy)
- Do you participate in social welfare activities? If yes, what and how?

6. Please comment on the impact of your business model on economic performances?

- Do you consider/evaluate food loss during processing and transportation? If yes, how? (initiatives in place to reduce food spoilage through targeted control of the cold chain transportation process, introduction of small packages/single servings, how to handle food that is not consumed or sold on the same day?)
- Do you consider/evaluate food waste during sales and consumption? If yes, how?
- How would you comment on your cost-related performance as compared to traditional food grocery models? Why is this?
- How would you comment on your profitability/ revenue-related performance as compared to traditional food grocery models? Why?

The impact of Covid 19 on BMs and (ad-hoc) practices

7. How has the pandemic affected your business?

8. How have you responded to these impacts? (from 5 values perspectives)

9. Are there other aspects that you would like to mention (e.g. other KPIs, practices, projects, collaboration with research)?

B. Appendix B

This section presents the following listed documents:

- Interview of Shixing Fresh
- Interview of Meituan
- Interview of Dingdong
- Interview of Yonghui

Interview of Shixing Fresh

Q1: First, please introduce your role and position in your company and functional organization.

A1: I am the public affairs manager in this company and I am mainly responsible for some external interviews and receptions. At the same time, I am also the Secretary of the Communist Party of China Branch of the company, responsible for many internal activities of the company . In this position, I have a very detailed understanding of the company's internal and external information.

Q2: So let's get to the point. First of all, I would like to ask, who are the main target customer groups of the company? What are their primary, individual needs?

A2: The summary of the customer group is that the two ends are the B-side and the other one is the C-side. The B-side is more for enterprises and institutions, and the C-side is more for home users. Since we are a fresh food e-commerce business, the main products must be fresh products. There are still a lot of fresh food categories on our entire platform. On the entire APP, there are 22 major categories and more than 10,000 kinds of commodities. In the past, the commodity types were mainly vegetables, beans and mushrooms, meat, poultry, eggs and milk, aquatic products and seafood, and fruits. With the development of the platform, the products currently needed by other daily residents, such as paper towels, shampoo and other daily necessities can be purchased on our platform.

Q3: Can you describe what is currently your company's highest priority for development? What specific measures are there to support your priority development strategy?

A3: I think there are actually several points that the company cares about from beginning to end. The first is innovation. This innovation contains a lot of content. For our company, the most important innovation is a digital innovation. In our company's view, digital innovation is more of a combination with the company's business. Including the innovation of the model, the innovation of various information technologies, and the innovation of various management systems. Innovations in the entire fresh food consumption service chain are included . Specific examples include using the company's owned data and some external data that have been operating for so many years to analyze the selection of fresh commodities and specific analysis of customer needs according to factors such as seasons. The second is the attraction and selection of talents, which is also a very important element in the development of the entire company. Whether it is the founder of our company or the heads of our various business departments, there is

a standard and complete system and plan for the selection and training of talents . The policies and culture of the entire company place great emphasis on attracting and cultivating talents, which is very beneficial to capable people. The third is actually very important, that is, the company's operating model and strategy. For example, whether your strategic direction is correct, that is, those other community group buyers will actually go a little faster, and they will spread it out on a large scale, while our company has its own business strategy system, which is equivalent to steady progress. At present, the cities with this layout are relatively concentrated and will develop into the next city after gaining a firm foothold in one city. It will not be said that it will be directly rolled out on a large scale nationwide like other community group purchases. Our company believes that it does not mean that if you don't go fast, you can go far. Our company has been on the track for ten years, and it is also one of the few profitable and sustainable electronic fresh food companies. Because in the past few years, many giants have entered this track one after another. They came and went quickly. Most of them invested a lot of money, but they also quickly left. We consider ourselves to be an upgraded version of the community group purchase model, because in our opinion, the conventional community group purchase cannot really solve the pain points and problems of the industry. It's not a sustainable business model.

Q4: I would like to know what the main cost of your company is, and the main source of revenues.

A4: The current source of income comes from the sales of this product . So for other income that other community group buying companies may have, such as franchise fees and advertising-income, our company is relatively free. The operation of our entire company pays more attention to an improvement of its own capabilities to make profits, rather than subsidizing profits by the income of these non-main businesses. Then the cost expenditure, first of all, in terms of marketing, the cost expenditure is actually relatively small. If you study this cost, you can look at the process and organizational structure of the enterprise. An enterprise, which systems it has, these systems are actually its main costs. Then our system comes from our purchasing side, followed by our supply chain side. The main cost of the entire supply chain supports the logistics cost of the distribution center and transportation . In addition, there are the costs of the R&D system in the process of procurement, supply and distribution, as well as some costs for the entire other business support departments.

Q5: Then the next more important question is what is the core competitiveness of your company?

A5: So let's start with the core competitiveness of its business model itself. Let's start with this. The business model of our company is actually a model that is scheduled to be delivered tomorrow, so it is actually a pre-order model, which is based on sales. That is to say, after receiving the customer's order, the platform will aggregate the total amount of the order, generate it every day, and then go to my base to order the dishes that the customer wants according to the total amount of the order. In simple terms, for example: today, 100,000 customers have ordered 100 tons of green vegetables on my platform, then I will buy 100 tons of green vegetables from my base, and all the vegetables will be sold in the morning. One by one to be delivered to the customer's fresh cabinet. Then this model is equivalent to my supply chain and the distribution center has no inventory, just when the product flow is very fast, I go to my base to purchase and order according to the customer's order volume . So I don't need an extra 200 tons of greens to put in my library. Fresh product, it is non-standard and perishable. Fresh food e-commerce is the most difficult e-commerce of all e-commerce, why? Because this fresh product doesn't last for a long time, and many fresh products are left for a day or two, it will rot and break. There is no sale in the afternoon when it is picked in the morning. Therefore, the quality of this fresh product, including its appearance, is very important. But most of the fresh food e-commerce model is to have the goods first, and then sell them to customers. Whether it's a supermarket or a vegetable market, all purchases are based on their own predictions, but such predictions can never be accurate because of the customers. What you want to eat today and what you want to eat tomorrow is very random, so this will inevitably lead to every night we will see, for example, at what time in the hypermarket, vegetables and fruits will be discounted. Because he can't sell it without a discount. If it is a fresh food e-commerce similar to the front warehouse, then his vegetables and fruits will also have special specials in the evening. But if the special price is not available, or if no one buys it, then these remaining products are actually his losses. He may not be able to sell it tomorrow, so these are all scrapped. Returning to the concept of fresh products, as far as the entire Chinese agricultural products are concerned, the loss is very staggering, 20-30%. So how to reduce this loss, and what kind of business model to solve this part of the loss is actually a problem worth studying. The business model of our company is able to accurately solve the loss of agricultural products, because I determine my purchase volume according to the customer's order volume, and the speed is very fast . In the evening, after the agricultural products come in, the inspection, sorting and packaging are completed. The cold chain truck went for delivery yesterday morning. And then arrived at the customer's fresh food freezer at seven or eight in the morning . And this dish is waiting for people in the pick-up cabinet, not people waiting for dishes. Even if you get off work late. That dish is still waiting for you in the fridge. Therefore, through this series of modes and means,

the loss of fresh agricultural products is firmly reduced, and the freshness of the dishes is guaranteed as well as the customer's sense of experience. The second point is actually from the composition of its entire supply chain, the distribution method and the layout of this site. In several cities where our company has settled, the density of self-pickup cabinets is already very high, and more than 95% of the communities have them. In addition, many enterprises and institutions, and even many subway stations along the line also have self-pickup cabinets . Then we also accomplish this efficiently through an intensive distribution. Our driver, he can deliver 600-800 parcels a day. Then he will be very efficient. Basically, he will go out with a full car, and one line will deliver more than a dozen communities or stations, and he will be able to deliver a station in 10-20 minutes, and then go to the next station. That through this simplified distribution to reduce the overall logistics costs. The cost of fresh food e-commerce is also very high, including front-end and back-end costs. In fact, many companies cannot reduce its cost. Many leading electronic fresh food companies are listed, but the financial statements after the listing are still unsatisfactory. It may be more than 10 billion in sales revenue, and his loss will reach 30% of the loss. This cost issue is also a very core point that leads to the unprofitability of this fresh food e-commerce company or the departure of the giant. In fact, our company has been doing fresh food distribution for ten years. It has been profitable since 2019, and it is difficult to continue to make profits in this track.

Q6: Could you please describe what the supply chain is all about?

A6: In fact, I have already mentioned it just now. For example, if a customer places an order from the app, and want to order the ingredients for tomorrow morning, our company will stop receiving orders for next day's morning delivery at nine p.m. of the day before. The back-office program will grab how many tons of vegetables you ordered today, and it will place an order with the suppliers. Then suppliers will deliver these vegetables to our distribution center before the time we agreed. It will efficiently complete some pre-processes at night in the order distribution center. When fresh food comes in, the food safety test will be carried out first, and all products will be tested. After the inspection is completed, the sorting of fresh products will be carried out. The purpose of sorting is to pick out some bad ones and also pack different dishes differently. For example, customers may buy half a catty of green vegetables on the platform, and they may buy a pound of green vegetables. Customized sorting and packaging according to customer needs. After the packaging is completed, the products will be transferred to the distribution center and settled at the settlement counter. Because the customer is on the platform, he will choose to buy a variety of ingredients, these ingredients will be packed into the pocket together, and then put on the cold chain truck uniformly. The cold chain truck will be delivered at about five or six in the morning, and once at two or three

in the afternoon, one by one to the community where customers are located. When the customer's package arrives in the pick-up cabinet, a text message will be sent to the customer, and then the customer can pick up his package. The choice of suppliers is mainly based on specific products. For example, for perishable foods like my leafy greens, suppliers will choose from surrounding cities and regions. In addition, the selection of suppliers will consider these qualifications of the base, as well as the scale of the base, the quality of products and other aspects. There are some fruits and vegetables of this kind that are easy to store, so it can come from all over the country. So in fact, we do not limit the origin of this supplier. Therefore, our company's suppliers basically have a lot in every province, but we pay more attention to its entire time and its entire quality. For this kind of perishable fresh product and the shelf life is relatively long, there are also two differences in the supply chain. For green leafy vegetables, refrigeration and other aspects are better. For products with a longer shelf life or without particularly strict requirements for transportation conditions, they will pay more attention to cost.

Q7: I would like to ask how the company conducts marketing or promotion, how to let customers know about your brand, or increase exposure?

A7: When it comes to marketing and promotion, in fact, our company mainly considers the deep cultivation strategy, which is to let customers experience our app to the greatest extent, and let customers repurchase . In addition, there are some conventional publicity methods, such as Weibo, WeChat public account, Douyin, live broadcast, news media and other channels. In addition, let customers be satisfied with our products and services, and then voluntarily promote it to those around them, forming a mode of word-of-mouth transmission, which is also a more important mode of marketing promotion.

Q8: Then the next one I want to ask you is, compared with other companies, what are the main advantages and disadvantages of your company's business model?

A8: Fresh food e-commerce is actually summed up in four factors-- various products, fast delivery, good shopping experiences, and cheaper price. The ability of attracting customers is also these four factors. How many products do you have? Are you fast? Is your product good? Does it make customers feel good? Does your price have an advantage?

First of all, we will discuss the factor of rich product variety. Our company compares other fresh food e-commerce models. The product richness of our platform is still very large. For example, in the case of front-end warehouses, because it is to predict customer needs, considering costs and losses, the scope of product selection is not as wide as that of our company. To discuss a good shopping

experience is to discuss the experience of the entire shopping process. Mainly, it can be explained by two data-customer retention rate and repurchase rate. These two indicators mainly measure the frequency of repeated purchases by customers on the company's platform and whether your customers can stay on your brand in the end. From these two indicators, our company is relatively good. At present, as far as Suzhou is concerned, our company is the most used e-commerce platform by residents, and it is also the world's first choice of e-commerce platform for Suzhou residents. When it comes to the price advantage, we can compare such friends of the same kind, such as Dingdong and Hema. Then the price of this model of our company's community group purchase is undoubtedly very advantageous. In addition to reducing the price through volume due to centralized procurement, our company's model can reduce losses and distribution costs, and virtually reduce the cost that needs to be shared by customers. We have three advantages in these four aspects. The main drawback is the delivery speed. Our company's delivery model delivers across the day, and Dingdong grocery shopping or Hema can be delivered to your home as soon as half an hour or an hour. This is incomparable to our company. However, our company feels that if we want to meet the condition of delivery speed, the dimension of comparison is not only speed, but also punctuality as a standard. Therefore, our company emphasizes more on delivery on time. Our company can basically guarantee on-time delivery twice a day, before 9:30 in the morning and before 4:00 in the afternoon. Through on-time delivery, our company can ensure that the food ordered by the customer will have the right time to pick up the ingredients for lunch and dinner. And we also hope that through the training of our company's model in the future, the residents will actually gradually develop this pre-made habit. Maybe every night after dinner, the family sits on the sofa and thinks about what to eat tomorrow. Then take out your mobile phone and see what specials our company's app has tomorrow. Then what dishes will be eaten at home tomorrow, and then go to order together such a scene. But you want our company to deliver in half an hour or an hour, which is not in line with our business model. Because I also introduced it earlier, we are a model of purchasing based on sales. At the same time, we also found that other fresh food e-commerce models can be fast, but the cost and price behind him are precisely the unprofitability and loss of the enterprise. Because the company wants to be fast, it needs to have a front warehouse, and it needs to have products in the warehouse first, so the company also bears the risk of loss. At the same time, we also need a lot of courier brothers, and the cost of courier brothers is actually very, very high. The courier guy sends dozens of orders a day, and if those dozens of orders are compared with the hundreds of orders we deliver intensively, the cost will increase greatly. At the same time, we not only have low delivery costs, but we can also return these reduced costs to customers.

As far as we do not charge shipping, there is no minimum purchase requirement for delivery.

Q9: So what challenges has your company faced after choosing this business model, or what challenges can you foresee in the future?

A9: The challenge I think is more from the business environment. Any enterprise of this kind will face the threat of competitors in the process of development. In the community group buying track, due to the relatively low barriers to entry, the joining of different competitors and the giants carrying huge sums of money to compete, there must be more or less Less will have a certain impact on your market share and customer groups. But after they leave, a large percentage of customers will come back to your platform because of a better shopping experience or better products. I n any case, the challenges of this business environment do exist, because for any business model, its customer base and its market are fixed, and more and more competitors join, then you get the cake part will be reduced. But who can go far and go for a long time still depends on the sustainable strategies and operations of each enterprise.

Q10: You also mentioned sustainable development just now. Does the company have any specific practices for sustainable development in terms of environmental protection and social responsibility?

A10: First of all, in terms of environmental protection, I think our company can do it in many ways. First of all, we will talk about research from the forefront, that is, the cultivation of agricultural products. Our company's business model can guarantee the large volume of purchase orders and the stability of continuous ordering. Then these two characteristics can promote the standardization and large-scale planting of agricultural products, which is conducive to ensuring the stability of product quality and the development of agriculture. The second part is mainly the distribution. Our company adopts the mode of intensive distribution, which can maximize the use of the transportation function of its vehicles. We can also meet the needs of 500-600 orders if we go to this community once, while Dingdong or Hema can only meet a maximum of 2-4 orders per delivery in the same community. This consumes more energy, and the planning and optimization of vehicle transportation routes is far less than that of our company. In addition, this pre-order model is the best among all fresh food e-commerce models to reduce product loss. From commodity packaging and settlement to intensive vehicle distribution, and then to the self-pickup freezer at the end site community, we ensure high efficiency and speed throughout the process, while reducing the time for fresh food to travel from the vegetable field to the table, and also through the whole process of cold chain transportation (refrigerated storage distribution centers, cold chain transport

vehicles, refrigerated self-pickup cabinets) to ensure that the loss of dishes is reduced and freshness is guaranteed.

At the same time, the self-pickup freezer is not open 24 hours a day. We have also designed the freezer to save energy and reduce emissions. We will calculate the opening time of the freezer before the driver arrives, and then cut off the power after the customer picks up the goods. The fresh packaging is also carefully designed by us, because you will find that the packaging bags we send can be used as garbage bags, which are exactly the size of the trash can, and can be recycled as your garbage bags. At the same time, the weight of our online products will also be differentiated according to the commom demand of customers. For example, for the same green vegetables, we will take into account the needs of single-population and multi-population families, and package different weights according to big data. For example, some are 250 grams, some are 400 grams, and some are 500 grams. Making a precise design for the weight of the dish is also an important part of avoiding waste. In addition, organic vegetables are also sold and recommended on our platform. As long as you open the app and enter organic, you will see the corresponding variety.

Q11: In addition, we also want to ask about food quality control, including what you mentioned at the beginning just now, the choice you would make of suppliers, which is a relatively important part of food quality control.

A11: First, we began to strictly control the upstream suppliers. We have strict qualification requirements and acceptance criteria for suppliers. Secondly, after all products enter the distribution center, they will be tested for food safety in our testing center. For example, vegetables will be tested for pesticide residues, and fish will be tested for malachite green content to ensure that all ingredients are safe. Third, we have built a food traceability system ourselves, which is also our own research and development. Then we can trace the source of each of our ingredients. Which base did this ingredient come from, what time, and which fresh distribution center did it go to? Are the test indicators qualified? At what point in time is the triage performed? What number of inspectors tested him? At each time node of the job process, the operator has a record. Including who and which vehicle delivered to him, and which customer finally picked up all the goods. The whole process of food traceability is fully guaranteed to ensure food safety . At the same time, our testing system is still connected to the government market supervision bureau, and all our testing data will be reported to the relevant government departments. At the same time, customers can view our food inspection reports in real time on the app and applet every day, so as to ensure the safety of food ingredients in an all-round way. So our mission is to let every family eat cheap and high-quality assured food.

In fact, everyone does not mention this safe dish, but people in the food industry know how difficult it is to make safe food.

Q12: You mentioned that it helps the upstream to carry out standardized and intensive production. Besides, what are the specific impacts on these upstream suppliers? Or is there any specific interaction with them?

A12: In fact, some upstream bases have also developed along with the development of our company, and they will grow in sync with us. Our company will guide farmers in the opposite direction and promote a healthier development of agriculture. For example, our company has big data on what kind of agricultural products are popular with customers in what season, then we can use this big data to guide farmers' planting. Because some farmers are actually out of touch with the market, they do not understand what is needed in the market, so there are often activities to help farmers, because farmers' products do not fully meet market demand, so they cannot be sold. We can guide farmers more scientifically through the analysis of big data to prevent slow sales. At the same time, we will also assist in optimizing the planting varieties of upstream farmers, optimizing its standards, and optimizing its scale. This is a very important aspect to solve the problem of unsalable agricultural products directly from the root cause. Give farmers and agriculture more scientific guidance, which requires the support of big data from companies like ours.

Q13: You mentioned earlier that you focus on recruiting and cultivating talents. Do you have any specific measures to share with us in terms of employee rights?

A13: In this regard, our company is more comprehensive. In addition to the most basic employee rights and interests in line with the national labor law, our company also has some special measures. First of all, in terms of skill development and career planning, our company has a retail college, which is equivalent to a university in an enterprise. All talents can obtain relevant vocational training and skills training in this college. At the same time, our company has two promotion opportunities every year. Through the promotion channels, employees can develop in the direction of management or professional development. Secondly, the entire enterprise's talent training and enterprise management systems are very standardized and transparent, and any systems and announcements will be disclosed to employees in a timely manner . The third point is the culture of the entire company, which creates a family culture. We hope that every employee can feel at home in the company, so in fact, there are no subordinates within the company. Everyone calls each other by their nick names. In addition, we have set up a lot of mother and baby rooms, leisure rooms, gymnasiums, and chat rooms for our employees to relax. In addition,

we have also organized a wealth of clubs, often organizing badminton, basketball, football and other club activities.

Q14: So, will your company have some specific public welfare activities or public welfare initiatives? Can you give us some examples?

A14: First of all, we will have some normal public welfare activities, such as donating materials, donating money, and helping the elderly. Basically, they will be carried out one after another every year. The second thing worth mentioning is that during the epidemic, in addition to our own donations, we will donate some vegetable and fruit bags to some blocked communities, that is, communities that have difficulty in buying vegetables. We will also donate some food and anti-epidemic supplies to frontline medical staff and volunteers. In addition, we will also donate daily necessities together with our upstream suppliers. The third part, which I think is the best in our company's public welfare activities, is still in targeted poverty alleviation and rural revitalization. Our company has been doing targeted poverty alleviation since 2017. We work with poverty-stricken areas in Yunnan, Guizhou, Gansu, Xinjiang, Qinghai and other poverty-stricken areas. We also use our sales-based procurement model to reverse the development of agricultural industrialization in poverty-stricken areas. In particular, we have also established a cold chain transportation center in Guizhou, which has driven the development of other industries in addition to agriculture. Good agricultural products in poor areas are transported to the dining table of ordinary people in the Yangtze River Delta through our company, helping farmers in these areas to increase their sales income. This public welfare activity also won the award for a typical case of national poverty alleviation in the past two years . So this is also what I think the entire company uses the business model to make some contributions to society.

Q15: So with regard to the company's economic sustainability, do you think there are two aspects you would like to emphasize on cost and profitability?

A15: We generally do not compare with some traditional food sales channels, such as supermarkets and vegetable markets, because it is not the same track, and the cost structure is different. But we can compare with our friends, such as Dingdong and Hema. Dingdong is currently listed, so his financial statements are also public, and there may be basically 10 billion in sales every year, so he may lose more than 3 billion. This is what I mentioned before, many fresh food e-commerce companies are actually burning money to maintain operations because their distribution and other costs will lead to losses. However, our company has been profitable since 2019, so the various measures and levels of our model that I mentioned before are actually a cost saving, which is precisely the focus that can help profitability. That's why our company is really good in terms of profitability. Looking at the entire fresh food e-

commerce industry, our company can be said to be one of the best in terms of profitability.

Q16: Ok thanks for the info. So in addition to this, let's take a look at whether the covid epidemic has brought some opportunities and challenges to the company's business? How is your company responding to these changes?

A16: In fact, this epidemic not only affects fresh food e-commerce, but also has a huge impact on all online shopping platforms or companies. The first is that there will be very large fluctuations in customer demand. As soon as the epidemic occurs, the community or city where they are located may be blocked, so customers develop the habit of hoarding goods at home. Considering that hoarding goods through offline channels may not be completely guaranteed not to be in contact with the virus, ordering and hoarding goods online has become the best choice for people. Therefore, for almost all online platforms, the number of orders during the epidemic has increased exponentially, with huge fluctuations, and it is difficult to predict based on past data . This is an opportunity and a challenge for enterprises. At the same time, when demand soars, the company's supply chain will be challenged. However, due to the impact of the epidemic, whether the suppliers and supply chain can guarantee the continuous satisfaction of your orders, whether the supply chain can be delivered completely, and how much the company's supply chain is affected by the epidemic are all factors that restrict the company during the epidemic. factors that complete the delivery. So how does our company respond? First of all, we will evaluate what is the current production capacity of our company. Is the company currently able to meet the pre-orders at the peak of customer demand? Does the company need to add new suppliers to increase and stabilize production capacity? Secondly, we will analyze that the company's internal operational capabilities cannot meet these orders. Does the company need additional manpower, material and resources? These are all determined according to the customer's demand. Due to its large fluctuations, it is difficult to predict. In addition to cooperating with our company's sales-based procurement model, some flexible supply chain configurations, such as outsourced personnel and vehicles, are optional suppliers are also required. Once the epidemic occurs, our company will quickly adjust our supply chain and rapidly increase our production capacity and transportation capacity to respond to possible changes in demand. Basically, the company will make some plans in advance for these two aspects, and then make some specific adjustments according to a specific change in it.

Q17: In addition to these, do you have any additional information or projects that you can provide?

A17: Our company, Jiangsu Academy of Agricultural Sciences and Suzhou Academy of Agricultural Sciences have jointly done some cold chain transportation and big data application topics, so that enterprises can do better in transportation planning and reducing losses. In fact, there is not much cooperation with competitors under the same model, but we will cooperate with some friends with different business models. Because we think it's important for businesses to be in a state of open learning. If the entire supply chain of various business models, upstream, midstream, and downstream can actually be added to the chain of your enterprise, your enterprise will gradually develop into a leader in the fresh food e-commerce industry. Therefore, we do not exclude cooperation with various enterprises or schools. Of course, the purpose of our cooperation is supply, is to better serve customers only. We also hope to learn some successful experiences from others to help our business model develop better. Everyone is in a win-win situation.

Interview of Meituan

Q1: What kind of position are you doing in Meituan?

A2: I am in charge of this delivery vendor management in Meituan, because Meituan will not sign this direct contract relationship with the chess player, he will subcontract the delivery service of the takeaway to the third party vendor, and then we are managing the relationship with the vendor.

Q2: How does Meituan position its target customer group?

A2: The target customers of Meituan are mainly divided into two groups: Tob and Toc. Tob is a large customer that provides some group meals, which is a large-scale ordering of corporate meals, but the business of this piece is a little smaller. Toc is the city's white-collar workers and students who usually order take-out.

Q3: Has Meituan ever considered its business priorities? Which direction do you want to go at the moment?

A3: At present, Meituan has just changed a strategy called retail plus technology, that is, it has been promoting everything to home, before then it was everything to the store, that is, to the store to buy the goods we need, and then the promotion of everything to home is through Meituan is able to order to any goods you need. Then enough to meet in half an hour or within an hour delivery, which is basically the first priority.

Q4: That just you also mentioned is the retail + technology, that technology to invent the Meituan what specific measures?

A4: Although it is an Internet company, but still a focus on the development of offline. For example, everything to home, first of all, the supply side, Meituan will develop the merchant channel, we now have Meituan flash sale, Meituan flash sale is to provide some retail goods. For example, umbrellas, screws, and then there is catering, catering is one of our mainstream. The fresh food channel is called Meituan Maicai . The distribution side is based on the different needs of customers, to the distribution of different levels, the best is the special delivery, will meet your half an hour of a delivery needs. Then, for some long-distance a delivery needs, there is a called full delivery . Technology means planning the route of delivery and realizing the best path through algorithms.

Q5: What is the main cost of Meituan now?

A5: The main cost of the whole platform is the cost of delivery, and then. We can probably say that he our side of the special delivery and fast delivery. Fast delivery

is the zero order those we do not cover. Probably a month is based on a delivery cost of more than 2 billion yuan. The management and technology costs are not high . The previous subsidy initiatives carried out by Meituan in the platform, the basic funding is from consumers and platform merchants, Meituan itself did not invest too much.

Q6: What is the main source of income?

A6: The main source of income is twofold. The first is the delivery fee to the courier, mainly paid by the platform and customers, such as delivery fees 5 pieces will be allocated to the chess player 3 pieces, the platform two pieces. The second piece of income is the advertising fee for merchants in the platform, to carry out the bidding ranking in the platform.

Q7: What core competencies does Meituan think it has compared to other platform-based company?

A7: Meituan is mainly to refine the operation and scale advantages, the same single then Meituan will be much lower than the total cost of hungry.

Q8: What is the entire supply chain of Meituan?

A8: Meituan upstream is mainly merchants, downstream is the consumer, and then the platform is in the middle of a supply chain is responsible for bridging, coordinating and managing the supply and demand matching.

Q9: How does Meituan do promotion and marketing in terms of promotion and marketing?

A9: Now the promotion is actually not as much as in previous years, because now the market share of 70%, do not need to do too much promotion. Marketing mainly through different channels, mainly in the mobile end of the short video to do some public service announcements. But traditional media, such as television, will now do less, because our consumers are younger, so they will pay attention to the new media they are exposed to.

Q10: What are the main advantages or disadvantages of Meituan compared to other food e-commerce companies?

A10: The first advantage is that the platform model is asset-light, such as the Daily Fresh front warehouse model, and then the entire pre-fixed costs will be very high. The first advantage is that the platform model is asset-light, such as the front warehouse model of Daily Fresh, and then the entire initial fixed cost is very high . The second point is that the flexibility to change is better, according to some external changes, you can do a quick change . The disadvantage is that there are some legal

risks, because the couriers are outsourced and the company does not sign social security compliance contracts with the couriers. And the platform model does not store goods, so there is no way to control the quality of the entire commodity.

Q11: So any specific thoughts on some internal and external challenges for Meituan?

A11: Meituan in the country, has now formed a barrier to the industry, our market share is 70%, it is very difficult for an emerging competitor to enter the delivery industry, because his initial investment will be very large, so that Meituan's barrier effect is very well done . One of the biggest challenges we face now is the policy risk, which is the problem of paying social security to each courier, because the couriers are outsourced, which is a labor dispatch policy in China, and are not required to pay social security.

Q12: Does Meituan have any initiatives in environmental protection?

A12: For consumers, the previous platform ordering page is that the merchant will automatically provide tableware to the consumer, but now it is a choice between using tableware and not using tableware, and if you choose tableware, you may be charged separately . For merchants, we encourage merchants to join a public welfare program called the Green Mountain Project, which is a program where you buy something from them and then they donate a penny to the program, which is to do some public welfare activities such as environmental protection. We will also recommend the use of recyclable or biodegradable packaging, but because of the cost factor, it is not mandatory. In terms of energy saving and emission reduction, the first thing we do is to optimize the path, and we mainly use electric vehicles for delivery.

Q13: How does Meituan find ways to avoid the loss of food during transportation and consumption?

A13: First of all, the loss of food during transportation. Meituan will carry out regular iterations of the delivery box for the flagger to ensure that the whole box can achieve a constant temperature within a certain period of time . In terms of orders, if a person orders more, the platform will be alerted.

Q14: What are the initiatives in terms of food quality and safety?

A13: For the platform merchants, we will require merchants to go to that upload food business license. And staff health certificate, and then for take-away couriers must be vaccinated, for special delivery, it will be mandatory to apply for a health certificate, of course , for merchants can also participate in activities such as live broadcast of the back kitchen, so that public supervision of food safety and kitchen hygien e.

Q15: Will Meituan have some education and training initiatives for merchants or couriers?

A15: Upstream, we will do a stratification of suppliers, for some chain KFC, McDonald's, for example, we will define it as Ka, is a large customer. Large customers, then he will be the overall cost of a platform, and then docked some commissioner ah, will be much better than the ordinary a small business. For some scattered small businesses, we will give him different levels according to his size. For large businesses, there will be some advertising space and commission and other resources, and then for new entrants to some small businesses will be cultivated, providing public courses to teach them how to do store management, and teach them how to market. In terms of downstream, couriers are divided into outsourced and fast delivery, and we will actually tilt more resources to outsourced couriers, because they are full-time couriers. Then we will provide couriers with induction training and a career growth path. If they do well, they will be promoted and become a courier, and then rise to become a station manager, which is responsible for the maintenance of the site . In addition to this, we have also joined forces with the National Open University to provide educational assistance to couriers to improve their education. For delivery businesses, we provide courses on how to manage couriers and control costs.

Q16: What about social welfare?

A16: Meituan will employ some people with disabilities , such as the Green Mountain Project or Hope Primary School mentioned before. On the internal side, if the courier's children are sick at home, we will go for them to raise funds for medical treatment, not only the Meituan company couriers, including hungry couriers we will also provide the corresponding funds. The Meituan is now profitable from last year.

Q17: How is Meituan mainly affected by the epidemic?

A17: In general, the epidemic is actually more of an opportunity for Meituan, First of all, I'll start from the platform merchants, from the supply of a platform, that is. Before the epidemic, there were many merchants who were reluctant to open this channel to Meituan because they felt that the commission was high, and because of the epidemic, people could not dine-in, and then Meituan provided them with a sales channel. So because of the epidemic, our entire supply has been greatly enhanced . But the impact on our delivery side is still quite big, if a certain area is blocked, all the stations will be closed, and the couriers in that area will be prohibited from delivering. However, now that the epidemic has reached a late

stage, the national policy has started to relax, allowing chess players to deliver in some epidemic areas, only that they need to do nucleic acid every day.

Q18: Then the company also did not take some initiatives to face these effects?

A18：Because of a form of merchant outsourcing, if affected by the epidemic, the entire merchant's performance and other indicators will do very poorly, if it is according to the previous evaluation system, the merchant may face withdrawal, the platform will force him to withdraw, and then we because of the regularization of the epidemic, we have targeted a set of sop, if a city has an epidemic, we will say to the If there is an epidemic in a certain city, we will say that the merchants in the area will be exempted from the rights and interests, that is, if there is a penalty, we will let him go to avoid punishment, equivalent to remove the impact of the epidemic, to protect them . Due to the impact of the epidemic, there is no way to do a manual delivery, and now the launch of unmanned vehicles and drones. Drones are still in the pilot, but unmanned vehicles played a role in the epidemic, for example, in Shanghai, Shenzhen, when the epidemic was very serious, we are through the unmanned vehicle to complete the delivery.

Interview of Dingdong

Q1: Please briefly explain your role in the organization

A1: I am the head of a delivery station of Dingdong(cayman) in Suzhou.

Q2: What are the customer groups that the company is targeting?

A2: Our customer group is mainly white-collar users in the community within a 10 km radius centered on the site

Q3: What do you think is the company's business priority (priority development)? What measures are taken to support the company to accomplish this?

A3: The first is to reach the balance of income and expenditure in certain cities, followed by the balance of the whole company . Secondly, pre-made dishes are also a priority for development. The advantage of pre-made dishes is in higher gross profit, which can reach about 17%-20% at the same time

Q4:What is the cost structure of your company? What is the main source of revenue for the company?

A4: In fact, the whole fresh food e-commerce industry, the cost of the main several aspects, the first is the cost of the warehouse, on the rented warehouse . The second is the main daily delivery cost is very high, warehouse distribution fee ratio at 5.5, is also relatively hig h. Another is the cost of IT system development is relatively high. Another is the cost of manpower. The labor cost contains two parts, in the city branch is mainly the procurement, sales, warehouse management and distribution of labor costs. In the head office, it is mainly the labor cost of some supporting functions. The main source of revenue is the sale of goods as the main source of revenue. The gross profit is generally around 20%-30%, divided into fresh and standard products, and the standard products may be relatively low.

Q5: What are the core competitive advantages of your company?

A5: The first is the level of the company's supply chain, as well as the integration of the industry, which is a core competitive, mainly reflected in the increase of the proportion of direct procurement of goods, Dingdong in 21 years with a total of 1,600 suppliers to purchase more than 12,500 SKU, the proportion of direct procurement of fresh produce reached 90%, also includes in-depth cooperation with the upper reaches of the supply chain, to enhance the operational capabilities of products to improve the gross margin and reduce losses . The second is the efficiency of warehouse and distribution operations. The third is the system capability, which I personally think is the core. System capability refers to the IT

system to optimize the planning of such a similar ability. For example, the delivery system, take a city like Suzhou, he has to deliver 10,000 customers a day. The daily delivery of 10,000 points, to be divided according to the grid, how to naturalize the most optimal arrangement of line scheduling, arrange the driver delivery, in this time a good IT system is very important, which also includes IT to supply chain management empowerment, through accurate prediction of sales to reduce the loss rate of products. Next is the establishment of an independent brand and brand expansion capabilities. In addition to food e-commerce, the company will expand other related businesses, such as rice or grain and oil brands. The benefit of these private brands is that they can leverage the platform brand advantage to gain consumer trust and goodwill and quickly penetrate the market. Dingdong 2021 has 40 regional processing centers in 14 cities, such as self-built pork processing plants that can deeply participate in the processing chain, which not only improves profits, but also feeds its own branded products back to the food e-commerce product sales, expanding the product range and improving gross margins. Strengthen supply chain control while not distracting and consuming the energy of the headquarters.

Q6: How does your supply chain work?

A6: Dingdong's upstream is mainly based on direct sourcing from origin, while specific commodities such as meat, liquor, snacks, etc. will be sourced from branded suppliers . To improve distribution efficiency, Dingdong purchases fresh food and sends it to a regional warehouse center, which is then used as the center for laying out a front-end warehouse that integrates warehousing, sorting, and distribution in the city. After receiving the order from the customer, the delivery person will deliver it to the customer within 30 minutes at the earliest

Q7：How does your company carry out marketing promotion?

A7: The company is mainly through elevator advertising, subway advertising and other traditional media to promote . In addition there is a single customer subsidy, for example, consumption of 200 full 300, the company gives 20-30 reductions or coupons. At the same time, we will open a limited time purchase activity every day at different times of the platform, which stimulates the user consumption vitality. Company will use the new media matrix theory, combined with big data technology to predict the consumption needs of different users, so as to intelligently place advertisements, create a more convenient online consumption environment for users, and then realize the precise marketing of enterprises.

Q8: What do you think are the main advantages and disadvantages of this model?

A8: First of all, this model is very much in line with the needs of today's young people, and it hits their pain points because the traditional fresh food sales model

requires getting up early to go offline to make a purchase, and many local young people do not have the conditions and time to complete this purchase step. Secondly, this model is also better adapted to the fast pace of the city, because we can ensure delivery from the nearest front warehouse to the customer's home in about half an hour . The second advantage is that through direct procurement can reduce costs, because through direct procurement, many intermediate links are eliminated, like the fish we usually go to the supermarket to buy the vegetable market, basically at about 12 yuan a catty, through the front warehouse, then you can buy eight yuan a catty. At least 30% lower cost. The disadvantage is that the front warehouse operating costs are too high, mainly in two areas, one is the front warehouse rent, the second is the human cost of sorting and distribution. The second disadvantage is that the damage rate of products is still very high.

Q9: What are some of the main challenges the company faces?

A9: The main challenge is that there are too many competitors in the fresh food e-commerce industry, with the entry of Internet giants such as Hema Fresh and Meituan, and the increased competition leads to the risk of long-term losses. The second is some internal operational and decision-making problems. To sum up, the business model can be perfect and consumer recognition, the supply chain can match the things. This is very important, including the method through which the business needs to achieve profitability . A few days ago, the daily freshness of the front warehouse closed down. Now can do profitable fresh electricity business or is very little. All companies know that the direction of food e-commerce is good, but what can be made, and how the company needs to do, many companies do not know, this is a relatively serious issue.

Q10: Do you have any initiatives to reduce the environmental pollution of food packaging? And how do you think front-end warehouses perform in terms of environmental protection in terms of carbon emissions?

A10: The main consideration is electric new energy transportation vehicles, and now more than half of the company's transportation vehicles are electric.

Q11:Has the company considered reducing the loss of food in the transportation process?

A11:For example, in the summer, leafy vegetables are very easy to rot, especially in the process of squeezing with plastic bags. So now the company will use the frame to carry and transport vegetables, but also not easy to squeeze caused by decay. At the same time, the frame can be reused, more environmentally friendly. The second related initiative, summer companies want to save money and want to ensure the quality of the dishes. And transport vehicles have both standard products that can

be delivered at room temperature, and such frozen products that require low-temperature refrigeration. Then the company will be equipped with insulation box, the fresh meat and other frozen products into the insulation box, and then the insulation box under the ice plate or ice, in order to ensure the quality of frozen products. This box can also be reused . This initiative is also based on the fact that our front warehouse is closer to the consumers and the delivery speed is faster, because this method can not keep fresh for too long. In short, some ordinary dishes that do not need to be frozen and dishes that need to be frozen are treated differently in the delivery process, which not only saves costs, but also ensures quality and makes the loss of food smaller. The staff can enjoy a special discount price for the products on the expiration date, which is very favorable.

Q12:How do you do food quality control and how does it perform? How do you think it affects food safety?

A12:All dishes are subject to a quality control sampling when they are put into storage, and the sampling rate is also relatively high to ensure quality and safety

Q13:Please tell us how the company influences the upstream and downstream partners?

A13:The company has its own fund, for some fresh vegetables that cannot be sold due to debts, accounts or epidemics and other reasons, the company will provide hotline assistance to help these farmers to solve these similar problems through the foundation. The company will purchase and sell the better part of the vegetables that are still available for sale. The company also helps poor farmers to develop growing skills.

Q14: Does the company have any initiatives related to employee rights or social welfare? If so, what are they and how are they achieved?

A14: The company created the Yunshan Academy to provide systematic vocational skills training for employees, as well as career planning, which is more comprehensive in content and form. There is also a staff stock or options, the company will give some stock and options to drivers or riders who have completed the delivery task better. Because the rider is delivering directly to the consumer every day, this incentive firstly encourages the rider to do a good job and secondly helps them to get out of poverty and get rich. This initiative is equivalent to adding a portion of sales commission to the rider's delivery income, which is also considered a part of employee welfare . The regular public welfare initiative will have some funding programs for poor families.

Q15: The epidemic has had a big impact on the food business. I would like to know in what ways did the epidemic affect the company and how did the company deal with the impact?

A15:. The front warehouse distribution business is affected, the community access is controlled, and the overall health of the warehouse staff; then there are large warehouse delivery is not timely, late arrival of goods leading to a short shelf life of a loss of goods expired. The company and the government to carry out a cooperation, like our company such a large, more famous food e-commerce, can apply to the government for distribution rights, vehicle special passes to ensure that vehicles can freely access the control area, for the wind control district delivery of food. The second is that the company will launch a group purchase, a community has a head responsible for collecting orders from the entire community, for example, full 3000 full 2000, the company will arrange for unified distribution. At the same time, the company will also launch some gift package table, which has four or five different prices, different content of the meat and vegetables package, for example, equipped with 50 yuan, 80 yuan, 100 yuan gift package, customers can choose according to the needs of any. In a nutshell. The company provides this kind of group purchase service for the community of the epidemic blockade to increase the company's income. During the epidemic, there are many organizations and individuals who need quarantine meals, including the people who are quarantined or the people who are centrally quarantined, and the people who are returning home from overseas. Therefore, the demand for quarantine meals is still very large. The company will reach an agreement with the government or institutions, and the raw materials for the quarantine meals will be provided by the company.

Interview of Yonghui

A1: What is the priority business level for the whole company? What direction will be prioritized?

Q1: At present, the core concept of Yonghui is still to meet the needs of users. The upgrade of all our stores' decoration, including the iterative upgrade of personnel, including the iterative upgrade of technology, and the iterative upgrade of marketing methods, in fact, all these actions are to meet the user needs. The state of the user ten years ago is different from the state of the user ten years later, right? Meet a change in the market and the new business model. For example, like we started to do the warehouse business, that we put the entire store more sq. compressed him from the original 18,000 to 14,000 now compressed to 9,000 compressed to the extreme compressed to 6-7000 within the sq. In fact, we are also the main whole package more preferential, highlighting the volume of this state, from the store more display, from the original technology of the shelf display, intelligent shelf display, all changed it to storage. All of it into the storage of such a concept, to do change in the form of low-cost volume. This is the development process of the enterprise, a normalized change, can not say that the kind of business is good, nor can you say that this route must be right, in fact, the enterprise of Yonghui, he is the courage of trial and error enterprises, he has been changing, in the process of change, when they do their own target group positioning, or do the market user demand, demand model analysis, it is possible to feel that this model is right Then there may be changes, from the earliest days of the fresh food market to convenience stores, then to fresh food supermarkets, community supermarkets, large shopping centers, large shopping stores, has been in the process of change, what is the upper limit of future users? At present, we can only say that in order to improve the viscosity of user repurchase to the greatest extent, our goal is actually to do it in two directions. First, we talk about fixing things, we do supermarket marketing concept, I want to maintain the supermarket's basic customer flow piece, for example: I want to do the morning market, I want to do the evening market, what is the target group of the morning market? For example, some idle, no work, or some housewives of this state. In fact, the morning market in many cities of Yonghui are very early, 6:30 open, that basically 6:30 to 9:30 this time period we do the morning market launched to the morning market lower prices. In the morning supermarket, after we buy goods from the mountains, from the market or supply chain to the store in the morning all the fresh food is very fresh, that we are doing the morning market fresher and lower price of this concept, we want to the morning market of this fresh communication chain to import it to the low price of this state. We attract the home life, for example, some retired old ladies, he has enough time to put their family of five, two old ladies, two couples, plus a child, a family of five

on the table of the day these things ready. We will satisfy this customer group. This customer group, in fact, his loyalty is not high, they have to consider the cost, consider the cost of the purpose is that they want to spend the lowest money to buy the best things. Then this part of the population why we have to do? In fact, from this part of the user group we can hardly go to get profit. In fact, there will be a basic profit in it, but it is difficult to obtain higher profits, and loyalty is also very difficult to precipitate down into their own loyal users. The opposite RT-Mart to do activities cheap he went to RT-Mart, next to the Wal-Mart very cheap, he went to Wal-Mart. This side of Carrefour cheap, he went to Carrefour, so this kind of users? In fact, we have to spend a lot of energy in doing the morning market this piece of user fixation this piece, in fact, we have to continue to sacrifice the price rate of goods. To create to strengthen the user's stickiness, so that users can come to our supermarket to buy every day, for example, all of the design concept of the morning market in the vegetables have two single products, fruits have a single product, dry goods have a single product, fish and aquatic products each have a single product. There are about six to seven single products in the morning market. In this case, its pricing is very low price rate is not more than five points, and even some single product competition some single product, and even take negative gross profit or flat gross profit this state to do to attract traffic. To get the user to our store inside, that 6-7 single products can basically cover the needs of this category of people a day of table consumption. It has two dishes, one fruit, two dry goods, such as rice or a list of things, aquatic products have a fish is very cheap, meat has a layer of cheap, basically six to seven single products can meet this type of user's day this state, this type of user is actually a great effort to do a piece of Yonghui, is also Yonghui in the industry to do a very good reputation part, that part of the people to Yonghui He feels that Yonghui is very cheap and fresh, and very cheap in the morning, and every day is different. I am not saying that I do zucchini today, I only do zucchini, it is possible that today I do cabbage, tomorrow I do Shanghai green, the day after tomorrow I do lotus root, today I may do Fuji apples, tomorrow I may do bananas, anyway, every day to this store I feel that the things are different and very cheap, in the long run, the user here he slowly basically his whole month three to four thousand consumption, a month may have 20 days in a month may be more than Yong Hui consumption. Slowly use this price image to promote the price strategy to gain consumer recognition. The second in the process of continuous operation of stores to position the supermarket business direction, for example, from the environment of lighting, background music, more comfortable air conditioning temperature, and some specifications of the dishes, for example, you buy 70 and 75 specifications of apples in the market, I put 85 specifications of apples is the same as the market price, but the 85 apples are more fresh. Through this positioning of

goods, the first is the price, the second is the positioning of goods, the third is the price strategy, marketing strategy, service strategy to do around the user this piece.

The evening market, in fact, is more of a quality customer of the supermarket. Why are there many young and middle-aged people who do not have time to go grocery shopping in the morning, for example, he needs to go to work after a hasty solution to the breakfast problem, then he has a lot of time at 5:30 p.m. or 6 o'clock, for example, he comes to the supermarket after work, because he does not have much time and energy to pay attention to the changes in the price curve of livelihood goods. For example, if I come to the supermarket, which supermarket is more convenient and which supermarket is more crowded, I will go to the supermarket. There are two reasons for this group to go to the supermarket: first is the convenience, the second is the herd of consumers, which place supermarkets are more people go to which place, supermarket goods are indeed very fresh and very cheap many people's concept, after the user over it, we actually a lot of profits in the interests of the majority of users in this part, and they are actually many people are not very sensitive to price. For us to do the evening market, in fact, we play the concept is called the night market fresher, Yonghui in picking up his whole fresh strategy. We say that all our goods into all-weather, no bonging display, always the same. All of our shelves are clearly identified by category, and each shelf has a low-priced product that attracts traffic, and is seasonal, all in season, and the lowest price. All the people come in and take a look, he will feel OK, will also feel very good, a look at all the shelves, the freshness of the goods, fullness, price image, including the staff of the site of this kind of sales buying skills, timely provision of services are very OK. Then this kind of customers, may be our interest generated part, that from the regular analysis of the whole supermarket shopping and sales situation, we will go through each period of time to analyze, for example, in the morning is concentrated on doing fresh food. If we talk about supermarkets in the morning to do 100,000 sales, fresh produce accounted for more than 80%, in fact, are to buy meat, vegetables, rice, noodles and oil. Only a very small part of the supermarket will go to buy other goods, such as leisure food, daily chemical products, including sports and cultural coaching products very little. They may have a rigid demand, targeted to buy, otherwise they will not go to buy such things. This is only the difference between fresh food and department stores, department stores slowly to the daytime hours, there may be some people who have more time, or some people in office buildings or more free movement will come to the supermarket to buy. Then, normally speaking, the sales ratio of the department store will slowly surpass that of the fresh food, and a large number of people will buy casual food, alcoholic beverages, or pregnancy stuff.

So far, we can only follow the changes in user demand, and to change, and now we are not talking about user demand? We often do userized consumption period. Consumer needs, for example, there will often be some customer guestbook will record the problems left by customers, such as customers hope that we have what goods, the heart of the price advantage, and individual specifications of the goods that Yonghui does not have. Then we will collect it according to the user's needs, to do some supplement of the product phase. Even more than just doing some supplement of the character, are improving, in fact, there is no set in stone those things.

Q2: What are the main core competencies again?

A2: You mentioned the second issue of core technology. YongHui in the past growth route, in fact, each time point of change, in fact, we are following the user demand changes in the change, before the first two times to talk to you offline this piece of the same, in fact, the past YongHui offline. In fact, in the domestic enterprises have done very ok and great, in fact, there are basically not many enterprises with him to match. These years, in fact, the performance of Yonghui in decline, Yonghui last year lost more than 3 billion, sales performance from the original volume of more than 130 billion, now down to more than 90 billion. That is actually caused by the general environment, after the epidemic travel inconvenience. The number of customers to the store and then a sharp decline in the second is after the epidemic, the income of consumers tightened the purse, more rational consumption. After the end there is the rise of community group buying, the rise of the market group buying, the online market in fact is also greatly affected by the compression of space to the offline entity this piece. We are also making some changes, and since we are seeking a breakthrough, we can't be passive to be beaten. Then we will also start to do online, Yonghui to do something is also very fast, in four years ago began to do their own shopping app, in fact, the company also has a great consideration. In the end we app is how to do. The earliest is also like the traditional routine, we go for more offline consumers, to be able to adapt to this piece in a timely manner, because the Yonghui national original the earliest we are doing membership customer membership services, the original is not to send customers a large number of membership cards, and later turned into cell phone number registration of electronic membership card, then from this membership card system, Yonghui in the country we have served nearly 300 million people The number of users is about 270 million. Then we already have a very good foundation in this place.

Then we were in this piece of e-commerce, when many community group buying started to rise. In fact, Yonghui is a little bit unique, we are actually very easy to convert the online users into users inside the app immediately. Of course, in terms

of customer acquisition, there are many pain points in the process of converting the 270 million users of Yonghui, in fact, more than 60 to 70 percent of them are actually middle-aged and elderly users. They are not very receptive to the app, then later found in the conversion process, in fact, there are still a very small number of people using, in fact, the conversion of the past is not a great role, the most early on spent a lot of money, spent a lot of money in doing user conversion. For example, new users, new users download to send 50 cash vouchers no threshold, later sent a lot of people found that many people did not, because he did not download the app, that later began in the store side, it began to use more than 1,000 stores nationwide end. Each entity store near the checkout counter, the supermarket entrance near the service desk, to go to large-scale promotion, using the form of subway promotion to do the promotion of the Yonghui life Yonghui to home business. Each physical store began to effectively and quickly to actively do, into the community, the two of us out of the community line, a piece of the community began to do ground promotion in each community. The first year, the amount of users actually accumulated is very good, the results achieved in many areas at that time were very good, but many new users found that there is actually no big difference with the others after using them, is to put offline goods to sell online, but also charge me delivery fees, the price is not a big advantage. Because they are doing the app, in fact, in the process of figuring out, because itself we do livelihood goods things. Honestly speaking watermelon into over a dollar, I sell more than a dollar in fact, the markup itself is not very high, if you set a low price to do, losing too much money, but also paste shipping is not cost-effective. In fact, online things, in fact, many things are we were forced to transform, but also by the market to promote the transformation. Everyone in the process of doing slowly people used for a period of time, and then no one used, people think you have no advantage online, that coupled with a period of time before the major platforms of e-commerce are in a bloodbath phenomenon, for example, Dingdong buy food in the burning money, Meituan Yousei in the burning money, Duo buy food in the burning money, all the online platforms are burning money, and a swarm of out, the power of capital rushed into the market later. The beginning is a great destruction of the ecological balance, all the old ladies are now very happy, bean sprouts nine cents. In Duo buy vegetables, I bought the rape nine cents very cheap, not limited to ten pounds to buy.

In fact, the offline entity users of the change a lot of. It is also the original time when the 70s people, the sixties people, are now starting to use smart phones. The most important thing for this part of the consumer is the word cheap. He downloaded all the platform, on the original I told you to do physical stores, before all the elderly users, wallet open inside a dozen membership cards, now is the phone open a dozen online app. and all the app are constantly pushing the news now more to buy less

than two kinds of food is particularly cheap. What vegetables are also very cheap on today's preferences. Today the integrity of the preferential selection of fruit cheap, they will find very happy, ten dollars can buy the original 100 yuan or so. Start in the market led to a sharp decline in the number of such individuals to the physical stores, many people can not survive. Online is also burned a chicken feather burned out of money, he did not have the money to collect. The accumulation of this time in fact we are looking at, these years actually do things are in the pain of the period of passing, in fact, I think now should be about the same, before a lot of capital influx, now there are also many are withdrawn. For the current active better, are beginning to transform it offline and online to start combining. The earliest Taobao is to do so, now, you see the current offline and online combination of survival rate is still relatively high some. The purely online ones are not working now, you see the daily priority closing down at the end of July. In fact, before the epidemic, Dingdong buy vegetables, he has been on the not good, he has been in debt, negative more than three hundred million, later if not because of the epidemic, Dingdong buy vegetables also can not survive, he is because Ma Yun in the back to promote the basic let him survive. Now you see, this kind of do purely online, you see the orange heart of the best choice also can not. Now can live, are a few big capital in the promotion. Like more than buy food he is supported by Poundland in the back, before the American group did a small elephant fresh offline brick-and-mortar stores also can not, the American group is now also to the home business - the American group preferences. He is now the United States Mission themselves did not do their own piece, but he is now with the national entity business cooperation, he does not have to do their own brand to the concept of online, that you like the current domestic scale of some of the representatives of various regions such as Zhejiang's Min Kang Hui, Anhui's a product fresh, fresh legend and so on these enterprises. In fact, now we all live more painful, because now the epidemic is not open, physical stores do not have business, online business you have to go smashing money to take maintenance, in fact, there is no profit, in fact, many capitalists want to cut leeks actually can not be cut, it is indeed difficult.

Q3: Briefly describe the situation of the supply chain of Yonghui online and offline? (ingredients incoming, several layers of links, etc.)

A3: Yonghui supply of the head of the channel it is very much, in fact, Yonghui now has 17 provinces nationwide, we are into the stationed, there are opened some physical stores, in fact, the larger part of the fresh goods, in fact, or each province is relatively flexible, but the provincial self-pick. For example, like Nanjing and Jiangsu Province leafy vegetables, is in Nanjing vegetable market for procurement. Ingredients, we are only according to the orders of each store is some demand, do some distribution processing, there is a special logistics car to send to the stores. The

online platform stocking is like this, is also centered on the provincial area, he will be a lot of areas by the provincial area he will have data inside this piece, is yesterday's sales, the previous week's sales, last month's sales will be derived from which type of demand will be more, for example, because online, the goods are standard grams, standard grams, then we will do this kind of goods, will be in the market picking demand will be concentrated Relatively biased towards the complete specifications of such goods, we will carry a centralized cargo, for the regional class of these goods, we pick the goods after delivery to the store, that all the stores inside the fresh e-commerce small store staff, employees will be for the commodity specifications here packaging, with the package of vegetables block as far as possible is to achieve the standard special, we will put it on special display in the shelves, such as the cold cabinet, ah, or frozen goods this piece and often the demand. Or frozen goods this piece and room temperature goods this piece we will have into the warehouse process, in the daily automatic settlement of the inventory of goods, he will push the inventory warning, that the inventory is not enough, the store will be on the goods inspection, after inspection and then into the warehouse. After the inventory is replenished to the safety stock, he will no longer prompt, then I online operation process, he is also the demand, is also followed by the order to see which goods will be better sold, inventory warning this piece of words, basically goods close to five or less than five when there will be a warning will prompt you to the market for replenishment. Supply chain online supply is actually part of the details of the provincial self-pick. Then there are some bulk goods, bulk goods, such as following a large number of season, we from the time of listing, for example, like a period of time before the dragon fruit honey treasure, or say from the Guangxi region of Guangdong, for example, like sugar cane also from Guangxi. Or Hainan over or bananas or potatoes, we Yonghui before is to have a national resource department will be on the financing system, extract data a class of goods national sales. For example, more than 200,000 tons of goods just like the volume of bananas is very large. It involves 17 provinces and cities, and the volume of bananas is very large, so he exceeds 200,000 tons a day, it is impossible for us to pick from the local market, because if you pick from the local market, your price will be very high, like if we have 200,000 tons a day, we basically go from the base to do the process of re-picking. We can put the price effectively to depress his price. This is really a certain amount of volume. In fact, also from the cost side to consider, including with some of Guizhou, rural cooperatives to go into some of the counterpart goods, you have how much goods I will give you to come, but also according to the specifications, for example. Before you talk about the same potatoes, 0.5 kg of how much, 0.2 kg of how much. What are the specifications for half a catty or more? What are the specifications for less than two taels? Different grades out, rough processing or deep processing, we are distinguishing this way.

Q4: The equivalent of, for example, some leafy greens, or small volume specifications, basically, for example, secondary markets or procurement from the hands of suppliers, like this volume is relatively large is basically the source of direct procurement model.

A4: In fact, there are some, there are some goods from the direction of the order, such as a lot of, for example, some Australian beef, high-end ingredients. For example, before we came to sell the ground shrimp, South American shrimp, like deep-sea abalone then there are some goods introduced from Japan that we talk about, that this kind of thing of goods, we do it through the big specializing in this piece, the import traders to do. Agricultural and sideline products this piece of business, let us go to understand the word of mouth, but this is also the bulk form, also with this kind of goods, a small amount of complementary. Supplementary goods from the active channel, then there are some local very resourceful, for example, like Yancheng in Jiangsu. The entire Sheyang is doing farming base, he raised bream, carp, grass carp. His price is far cheaper than you shipped from Nanjing, and the freshness of others will be higher, then I have a resource advantage over them in the purchase price of the Shanghai area.

For example, if we sell hairy crabs, we certainly don't need to enter from Poyang Lake, and we can't reach such good freshness, then we go to Xinhua, Jiangsu to enter. I can get the same specifications, and my taste is good. The complementary nature of some goods has special price advantage in the local area, we can do so.

Directly is some, for example, more unique have some base has its advantages of the product will be kind of procurement.

In fact, we just each province. Its procurement channels supply chain is very much, for example, like our Jiangsu, our earliest fresh meat, for example, with the collection of television cooperation, cooperation with the Shuanghui, later we cooperate with the big red door. Or we go to cooperate with Zhejiang, or we go to cooperate with Hebei's light soft very much of this technical some meat products suppliers there are many is when you do a relatively good, there are very high quality suppliers, but like these large categories of some of the goods related to the needs of the people's livelihood of this piece, we will do the same city comparison, for example, I Henan Province, the supply price of live pigs now, for example, is up to 19 yuan For example, the supply price of pigs in Henan Province is now 19 yuan, why is it 21.5 yuan in Jiangsu Province and 1.5 yuan higher there? Then it is about some technical differences, you say Henan, he farmer more, his market demand is not so very tight. His price will be cheaper then like this side of Jiangsu, because of the strong control of environmental protection, now most of the sources of meat in Jiangsu come from Huai'an and Yancheng, Dongtai, Lianyungang piece in fact, a

piece of northern Jiangsu pig farming, the whole of southern Jiangsu do not allow you to raise pigs. That his market is very tight, like Nanjing, the majority of meat sources from Anhui. Like this side of southern Jiangsu, basically like Suzhou side is no pig farms, his meat are coming from northern Jiangsu, how to engage. For example, like Jiangsu eggs are higher than Anhui, higher than Henan, because Jiangsu's egg resources are relatively small, only Nantong is the base of egg products. There are also Nanjing's Yukou, in addition to these two places, the whole of Jiangsu you can not find a place to raise chickens, that if the two local egg sources alone, is unable to meet the needs of the entire Jiangsu province, then he will be from Anhui into eggs over, from Hunan into eggs over that from other places into eggs over, because there are freight costs in it, there are loss costs in it, he arrived in the province, that the price of Jiangsu eggs is significantly higher than Hebei There is no comparability, that if the general nature of, for example, Jiangsu is the production of rice, Anhui is also the production of rice, Zhejiang is also the production of rice, that from the rice demand, then, the province itself produces rice. He foreign rice to fill the market, he is bound to be cheaper than the local rice prices, he can this way, either Shanghai, or Jiangsu, or Anhui, Jiangxi, Fujian are produced rice, but these provinces are not produced in the northeast rice. But only the northeast rice production, the production of northeast rice, the northeast rice he shipped from the northeast, the price of several provinces, the price of rice class is very variety, you say I sold two dollars 15 cents a catty in Jiangsu, I shipped in Heilongjiang to open is in one 95 cents two blocks or so, a catty of rice in the markup only four points. Price 10 cents into, the loss of rice is indeed also very large, because from the origin over, he has moisture volatilization over, to this side only nine point eight lights. After that, the price to each province will not be particularly large error. Like Shanghai will be slightly higher outside, like the whole Jiangsu Province, Suzhou, in fact, and Nanjing's rice prices are not very different. This kind of differentiation, in fact, we also follow the properties of the commodity to come, the real estate in the region of the species of his supply relationship issues.

Q5: What do you think are the main advantages and disadvantages of a business model that integrates online and offline?

A5: Online is actually doing the user traffic supplement. Offline is actually still doing a gross supplement, in fact, there are not many online is making money online. We stratify the user, the user he is used to app shopping, we actually play into the channel, a line, online is also available to buy, we speak of multi-angle, all-round, first do the user demand this concept.

This in fact do online some uncontrollable factors. The loss of control is very serious. And speaking of costs, the cost of our distribution costs, the premise of some poor

operating costs, in fact, in a way, in fact, we are analyzing the problem, many people are telling us that I set up a front warehouse 20 square, I use 20 people, I create the performance of your performance with 5000 square meters of hypermarkets. Or you use 100 labor. I can do 200,000 performance, but you can actually only do 200,000. The owner will go to calculate this account, I have less 5,000 square meters of rent. Daily rent I have 80 less people on daily wages, can't I go make up for this cost I've lost on line? I sent a link to you the other day, and now their pain point is that users are particularly unstable after acquisition. Often lost, in fact, the same as you do not say you in this store I do physical stores I sell eggs for 3.8 yuan on this side. Other places also sell eggs for $3.80. In fact, competition is everywhere, every link is like this, online is also like this. Our concept of retailing is changing, in fact, the advertising chain of consumers is also changing, everything we do is changing around the consumer. Why? Many people in China are over 40 years old. In terms of shopping needs, I want to take a look, I want to see the meat is fresh, once I buy lettuce online today, the quality is not good will affect his second repurchase of this mentality. Because the traditional concept of the Chinese people is like, very like the hustle and bustle. Fresh e-commerce, why say the last two years began to do, ten years ago in fact, e-commerce began to do, Taobao began to do e-commerce. Why do not do up ten years ago? In fact, a decade of consumers are also slowly changing, in fact, with a decade ago that a group of people. Young people have become middle-aged people now, they feel that online grocery shopping is possible, that we to this state now. Many of the middle-aged and elderly groups are still accustomed to the case I have time I go to the market to buy meat, I must go to see the master site to do whether the meat is fresh.

Once he has a similar bad shopping experience after his online this degree is very poor. His online purchase is also very troublesome, I do not know where you are, I also can not see people. I went to the market to buy bad food, go back to find that you cheated me, rushed to your stall in front of the call ah, flung in your head, I vent a party, but I do not have this feeling online, cold, I placed an order dish is not good, I return it, today's order, tomorrow the dish put me yesterday's order, today the dish sent over, I replaced the dish can not be used, I want to return the order, pick up the goods and then go back, the third day again replenish me fresh or how about that. I want to eat today but I ordered today's food can not I return and wait a long time, is a lot of older people feel that it is better to go to the market to buy food, to the supermarket to take a look, offline things these two years has been discussing the topic is that we want to return to the essence of retail. The basic essence of traditional retail is the relationship between buying and selling goods. Buy goods I see that there are goods, fresh goods, the right display, the right price, good service and the relationship between the buyer and seller, rather than become online this way, but online it is cold, now the experience is really not as good as offline. Now

all the online users, businesses are focusing on solving the problem, to the goods version of the same, all the online fresh class of e-commerce, in fact, in solving the quality of the user goods freshness is also very headache, such as this weather now I last night I from the market into the vegetables, after our packing decomposition station for packing decomposition is very good, I put inside the fresh cabinet, put a day more than four hours later When we are packing, a little one or two hours of temperature, time difference control is not good, the quality of the dish will be bad. The user will have a problem with your brand, I bought a very good lettuce, what if it goes bad? There are some people who feel that he is willing to sacrifice the cost of commodity quality for the cost of his time, and he can eat it if he puts up with it. They may be thinking that all of our platforms to buy food quality is very poor? But I do not know all the platforms in the late in doing commodity quality control link, in fact, how much thought has been spent in fact. The original may be a cabbage to buy standard specifications to you, I have to pull off how many leaves? After plucking my standard specifications packaged to you, to your home after you found bad, you can only take 300 grams because the amount is not enough. But if I say I'm in the offline market environment, I don't need to pick leaves, and I don't need to have a standard gram. Big deal in picking up a layer I can still sell more, the regular fresh loss I only 3-5 points when offline, online loss on more than ten points. In fact, sometimes, once your online goods loss value is greater than offline, and then, you online our own words, you are not allowed to set a high price to sell, normally speaking, offline cabbage into a dollar, I sold a dollar five I earn 50% of the gross profit, but if I say that my online is also a dollar into the price, but my loss point to 10% of the invisible, my online costs have gone to One dollar one, I then sell one dollar five. I do not earn only 40 cents, so if I sell a dollar and a half for everyone on line, I earn a dollar less. But the online dish, if the person bought back after the dish does not work, just the quality is not good, he is not to return the goods, after the return and then returned. The cost is your again, because you see you buy today over that bought yesterday sent over today. I put another day today, tomorrow and then returned, three days later the goods are already attrition, you not only say you forty cents did not earn, but also lost a dollar one. The difficulty of fresh e-commerce operations . A lot of online also have to do, often offline I enter over to put on the shelves to sell my day today, I sales help turn faster, the day I sold, but the rent, utilities staff wages, and online at the same time, in fact, online costs are not much cheaper than offline, why? You need to integrate from the wholesale department after the end of the integration over, I went to the big package decomposition station to decompose. Fixed specifications, I itself went to a process. After finishing, I then put it into the front warehouse, online customer pickup. There are front warehouse staff distribution, delivery to the hands of customers to take up, he is more than our first-line link 3-4 links, these links have costs, the cost of preservation, transportation

costs, right? The personnel part of the cost is actually not low. After we have been exploring offline, we just need to control which link, our costs will be reduced. In fact, all do pieces of business we are thinking about this thing, indeed, if we say first all do a good job, reduce the rate of customer complaints, return rate, right? The customer's repurchase stickiness to strengthen up, indeed, can also be profitable. But if any link is not well controlled, online itself I earn less than offline, but if you sell online and offline at the same price to consumers, but China now has the concept that I buy things online cheap, now it is very strange, buy things online must be a cheap figure. Now there is the concept that all the people all the merchants in doing user this piece of words, the promotion of this piece of words must go to do new customers to pull new. The new customer is actually a discount, coupons, cash coupons or goods, low price one point to buy, do a lot of activities, he wants to stabilize his customer power, he wants to get his traffic this piece, like for example, before we analyze why beautiful Youxiao will close down. The original market did so well in the Shanghai market, right? Dingdong buy food also gave beyond.

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