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DIGITAL TRANSFORMATION OF RETAIL INDUSTRY UNDER THE INFLUENCE OF COVID-19: A CASE STUDY IN CHINA

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Abstract:

After the outbreak of the COVID-19, the retail industry has been hit unprecedentedly in all aspects. Obviously, the traditional retail business model is no longer suitable for today's market environment. This research takes the retailer from Guandong, China, Urban Neighbourhood Ltd as a case study company to analyze the overall situation of retailers in the context of the long-term COVID-19 and identify the business model by using the business model canvas. This research adopts the Business Process Management (BPM) Lifecycle model as the main research methodology. Data collection methods include conversation, observation, interview and questionnaires. Meanwhile fish bone diagram, SPPS and WEKA were the tools used in the analysis. 327 responses were recorded from 400 questionnaires distributed and interviews were conducted to investigate the current situation of the case company. A total of 11 key factors namely, (i)customer segments (ii)shopping channels (iii)classification and placement of commodities. (iv)return service. (v)commodities supply (vi) delivery service (vii) business hours (viii) popularity of promotional activities (ix) Accessibility of the services (x)epidemic prevention work (xi) queue time have been identified to be the factors affecting the performance of Urban Neighbourhood Ltd during the outbreak of COVID-19. Finally, this research proposes the basic idea of digital transformation with a new business model and redesigned a sales process including omnichannel sales and distribution for the company.

Keywords:

Digital Transformation, Business Process Management, Business Model Canvas, Retail, COVID-19

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Introduction

Since the outbreak of COVID-19 in 2019, Chinese retail industry has been hit hard. Chinese government has implemented strict epidemic prevention measures for a long time, and many stores have been forced to close for a period of time from time to time to deal with the new round of epidemic. During the COVID-19, China's total retail sales have slightly decreased. However, online retail sales have ushered in considerable growth(Ma, 2021). Retailers including Urban Neighbourhood Ltd have to face a reality: under the influence of COVID-19, more and more consumers choose online shopping. The COVID-19 has accelerated the digital transformation of the retail industry (Neo, 2020).

In the past decade, digital transformation has become an increasingly popular term. With the development of Internet technology and the innovation of digital tools, the pattern of traditional industries like retail has changed. For example, Digital transformation has brought new distribution methods and new customer relationships to the retail industry. Digital retailers can conduct sales and distribution through new ways such as online sales and regular door-to-door delivery. Digital retailers can also communicate with customers through social media, online shopping platforms and review websites. Faced with the new industry development trend and the severe challenges brought by the COVID-19, traditional retailers must re-examine their current business model to improve their services and maintain their advantage over competitors.

Urban Neighbourhood Ltd is a chain grocery store in Guangdong, China. At present, their main business is to sell groceries to residents in the community where their stores are located. After the outbreak of COVID-19, their supply chain, like other companies, was severely impacted and their stores have faced the challenge of intermittent closures (Bradsher, 2022). They mainly faced the following problems: 1) In order to cope with the new round of the epidemic, their stores often had to comply and close for a period of time from time to time. 2)The irregular suspension of stores not only affected their sales, but also had a negative impact on their supply chain. 3) Even when they were open, their performance was dismal. Although they do not understand why, many of their customers have reduced the time of shopping at their stores. Based on the above background information, the following problems are exposed: Under the influence of COVID-19, the original mode of the consumer market is rapidly changing, and the traditional pure offline retail model is almost collapsing, and they are no longer suitable for the current market. Hence the objectives of this research are: 1)To identify the existing business model of Urban Neighbourhood Ltd. 2) To identify the weaknesses of current business model of Urban Neighborhood Ltd under the influence of the COVID-19. 3) To propose a new business model for Urban Neighbourhood Ltd.

Literature Review

This section review literatures from three domains. First, business model and business process of digital retail. Second, digital transformation of traditional industries. Third, consumer behavior during COVID-19.

Business Model And Business Process

Öhlin (2019) made an in-depth exploration on the business model of retail enterprises after digital transformation. Although scholars have different definitions of business models, researchers generally agree that business model is a theoretical tool to describe how business organizations create, deliver and capture value(Öhlin, 2019). Many scholars have proposed

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different frameworks for business models. These frameworks represent the value stream of business models in a strict form. Krumeich, Burkhart, Werth, and Loos (2012) organized and reviewed these frameworks. These frameworks include Objectives, goals, strategies and measures (OGSM), Business reference model, Component business model, Industrialization of services business model and Business Model Canvas. Among these models and frameworks, OGSM and Business reference model lack detailed analysis of the internal key elements of the business model. The Component business model lacks a general description of the business model. And Industrialization of services business model has the potential problem that it is difficult to adapt to changes. Business Model Canvas has a comprehensive business model overview and internal key element analysis, which can be applied to a wide range of industries.Therefore, the business model framework used in this research is the Business Model Canvas proposed by Osterwalder and Pigneur (2010).

Business Model Canvas is a visual framework that depicts how business organizations create, deliver and capture value. The business model framework is shown in Figure 1. The canvas consists of nine building blocks of a business. In the middle of the canvas is the value proposition of the business identifying the product that the business if offering. The right side of the canvas depicts how a business engage with customer to make money: customer segments, customer relationship, customer channels, revenue streams. Meanwhile, the left side of the canvas depicts what are needed to operate the business: key partners, key activities, key resources, cost structure (Osterwalder & Pigneur, 2010)

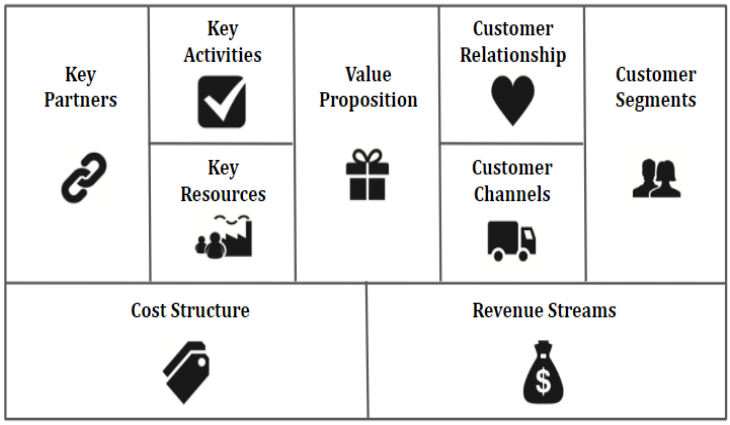

Figure 1: Business Model Canvas

Source: (Osterwalder & Pigneur, 2010)

The traditional retail sales strategy is limited by a single sales channel, resulting in low market coverage and avoidable costs. Gao and Su (2017) studied online and offline stores, but didn't combine the two methods. Kusuda (2019) conducted extensive research on a retail method of "buy online and pick up in store", BOSP and proposed a cross-channel operation model, and he believed retailers should operate both physical and online stores. However, Kusuda (2019) didn't make further research about omni-channel business model.

Conger (2014) provided a comprehensive overview of Six Sigma and its relationship with business process management. Six Sigma is a data-driven business quality management method that can be used to improve the quality of business processes and reduce costs. Six Sigma adopts the DMAIC (Definition, Measurement, Analysis, Improvement, Control) approach for business process improvement. Six Sigma is considered very effective in

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improving quality and increasing customer satisfaction, but the implementation cost of this method is very high. Implementing Six Sigma requires collecting a large amount of business data and requires high professional requirements from employees.

Dumas, La Rosa, Mendling, and Reijers (2018) described the process of Business Process Management and explained BPM Lifecycle. BPM lifecycle defines the process of implementing and managing business processes within an organization as a standardized circular process. BPM lifecycle is often used by researchers and scholars to improve the original business process. BPM lifecycle emphasizes employee engagement and collaboration, and by collecting feedback and feedback from employees, business processes can be effectively optimized. As shown in the Figure 2, Dumas et al. (2018) described BPM Lifecycle as six phases, namely process identification, process discovery, process analysis, porcess redesign, process implementation, process monitoring and controlling.

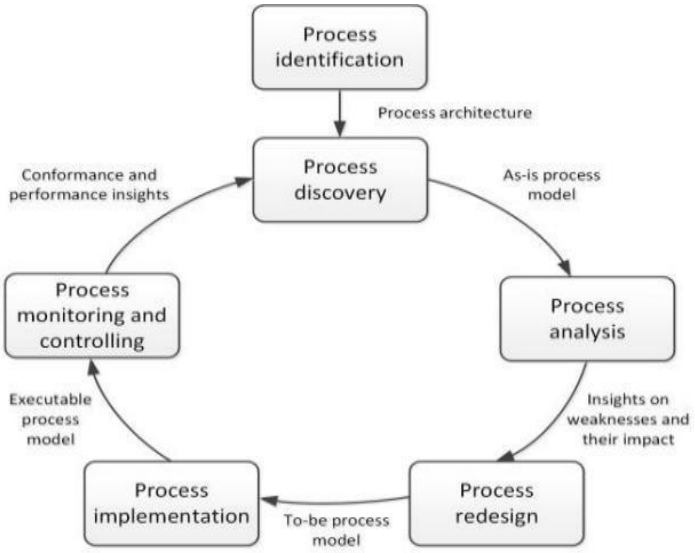

Figure 2: BPM Lifecycle Model

Source: (Dumas et al., 2018)

Six Sigma emphasizes details and precision in business processes, and discovers defects through quantification and business data analysis. However, due to the need to protect commercial confidentiality, this research cannot use the specific commercial data of the case company. The BPM life cycle emphasizes employee involvement, and it can optimize the entire business process and has strong adaptability.These fits well with the objectives and conditions of this research. Therefore, this research adopted Business Process Management (BPM) Lifecycle model (Dumas et al., 2018) as the main research methodology.

Digital Transformation

The definition of digitalization is changing with the continuous development of information technology. At first, digitalization refers to the process of transforming information into digital form. Vial (2019) conducted an in-depth research on the transformation of the business model in the digital transformation of the retail industry. Vial (2019) sorted out the description of digitalization by many researchers before and constructed a digital transformation framework. According to Vial (2019), current researchers do not have a unified definition of digital transformation. Fitzgerald, Kruschwitz, Bonnet, and Welch (2014) investigated the challenges faced by enterprises in digital transformation and provided enterprise management with digital

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transformation implement recommendations. This research adopts the definition of Fitzgerald et al. (2014) that digital transformation is the use of new digital technologies to enable major business improvements.

Zhang, Mei, Bao, and Shao (2021) conducted an in-depth research on the cooperation mode of product suppliers, platform service providers and logistics providers in the supply chain of digital retail model combining online and offline. Zhang et al. (2021) put forward a new supply chain coordination model based on combination contract after analyzing the important factors such as product sales price, platform service level, logistics transportation time and profit under two different modes. However, Zhang et al. (2021) did not elaborate the detailed operation process of each link of the supply chain under this new digital supply chain coordination model.

Lehdonvirta (2013) made a detailed study on the impact of digitalization on consumer culture. With the digital transformation, the communication between retailers and customers has become more convenient, and the relationship between retailers and customers has also changed. Therefore, after the digital transformation, businesses must use popular Internet tools (such as social media and review websites) to manage their customer relationships. However, Lehdonvirta (2013) only investigated the impact of digitalization on consumer culture, and how retailers should manage customer relations after digitalization transformation remains to be studied.

Consumer Behavior During Covid-19

Wang, Xu, Schwartz, Ghosh, and Chen (2020) conducted a broad-based consumer survey and put forward suggestions on retail management. The survey revealed that, COVID-19 has led to significant changes in consumer shopping behavior for retail. These changes include less frequency of purchases, changes in shopping locations, less unnecessary purchases, and so on. According to the changes in consumer behavior, Wang et al. (2020) put forward some suggestions for retail management, such as providing online sales channels, providing self-service checkout machines, improving the delivery speed and accuracy, providing contactless payment channels, improving business hours, improving commodities supply, improving store cleaning and epidemic prevention measures, etc. Wang et al. (2020) also suggested that retailers could use promotional activities as a short-term plan to attract more consumers. And Keller(1993) found that promotion revenue can be defined as the perceived value attached to the promotion experience, including the promotion exposure and the promotion experience of consumers. This definition implies that consumers' attention to promotions and consumers' satisfaction with promotions will affect consumers' purchasing behavior.

Timotius and Octavius (2021) conducted a systematic review examining the impact of changes in consumer behavior on retail as a result of the COVID-19 pandemic. The research design and methodology followed the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) statement. According to the research of Timotius and Octavius (2021), different generations of customer segment have different behavioral changes. Although offline shopping is still the choice of many people, young consumers prefer to shop online. Retailers should integrate online and offline sales channels into omni-channels instead of replacing each other. Rushi and Pradhan (2022) used a questionnaire method to investigate the factors influencing the behavior of consumers aged 18 to 60 when purchasing groceries. Rushi and Pradhan (2022) found that during the COVID-19 pandemic, product quality, hygiene habits of

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delivery staff, return service, product accessibility and usability are the important factors influencing customer shopping behavior.

Brandtner, Darbanian, Falatouri, and Udokwu (2021) used text mining technology to collect consumer review data from Austrian retailers in their research, and used a service-quality assessment model to analyze consumer sentiment. Brandtner et al. (2021) found that consumer satisfaction with retailers generally declined during the COVID-19 pandemic. The main factors affecting consumer satisfaction include: store layout and product placement, equipment in the store, product availability, and waiting time in line. In addition, payment channels, shopping guide service provided by store staff, and product prices are also important factors that affect consumer satisfaction.

Research Methodology

This research adopted Business Process Management (BPM) Lifecycle model (Dumas et al., 2018) as the main research methodology. Due to time and resource constraints, this research only focused on 3 stages of the BPM lifecycle as per Figure 3.

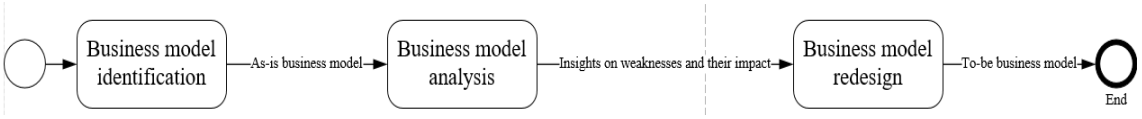

Figure 3: BPM Stages In This Research

1.Business model identification. At this stage, conversation and observation methods were used to investigate and analyze the business model of Urban Neighbourhood Ltd and mapped it into nine building blocks using the business model canvas (Öhlin, 2019). A total of 11 employees of Urban Neighborhood Ltd were interviewed. Research objective 1, which is to identify the existing business model of Urban Neighbourhood Ltd, has been achieved at this stage.

2.Business model analysis. Three main activities were conducted in this stage: (i) A fishbone diagram was used to conduct a preliminary analysis and deduce the cause of the problems faced by Urban Neighborhood Ltd. (ii) In order to obtain the consumer experience at Urban Neighborhood Ltd, 400 questionnaires were distributed to people who had shopped at the company's stores in the communities where the stores were located by random sampling. Finally, 327 responses were recorded as the final sample. In this way, the researchers can get to know the actual situation from specific target population and collect the information needed by researchers with less time cost(Chamhuri & Batt, 2013). (iii) SPSS and WEKA were used to analyze the responses obtained, including data preprocessing, descriptive analysis and correlation analysis, so as to find out the main factors that caused the company's performance to decline. Research objective 2, which is to identify the weaknesses of the current business model of Urban Neighborhood Ltd under the influence of COVID-19, has been achieved at this stage.

3.Business model redesign. A new business model is proposed after considering the results obtained in business model analysis. The third research objective, which is to propose a new business model for Urban Neighbourhood Ltd, has been successfully achieved at this stage.

At the process level, four steps were taken as shown in Figure 4: (i) Process identification: the the problem to be solved is determined and the process involved in the problem according to

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the gap between the old and new business models, and clarify the relationship between the problem and the process. In this step, the measurement value used in this business process management are also determined. For example, less time, lower cost and higher quality. (ii) Process discovery: the process to be improved was defined by establishing an As-is process model using Business Model Management Notation (BPMN). (iii) Process analysis:, according to the defects found in the business model analysis, the defects of existing business processes were analyzed, and possible improvement measures were proposed. (iv)Process redesign: based on the defects of the existing business process and feasible improvement measures, each link of the business process was redesigned. The improved business process was designed by establishing the To-be process model.

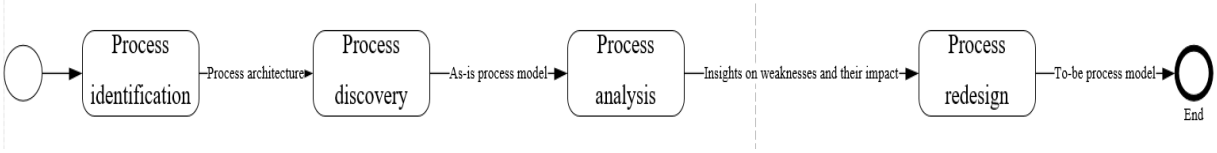

Figure 4: Adapted BPM Lifecycle Flowchart

Results nd Discussions

This section presents the results from the research in the following manner: 1.The results of current business model identification. 2.The results of business model analysis. 3.The results of business model redesign and business process redesign.

Results of Business Model Identification

The business model of Urban Neighbourhood Ltd is shown in Figure 5. This is the results from observations and conversations with the staff at Urban Neighbourhood Ltd. After analyzing the data collected, the existing business model of Urban Neighbourhood Ltd can be represented using business model canvas as shown in Figure 5.

Key Partners	Key Activities	Value proposition	Customer Relationships	Customer Segments
Express companies; Real estate companies; Suppliers; Technology company S; Technology company C.	Sale; Customer service; Supply chain management. **Key Resources** Store; Employees; Retail store management information system; RFID.	Provide convenient general merchandise purchase service for residents in local communities.	Personal Assistant (PA); Transactional **Channels** Direct: Stores; Telephone.	Mass market; Distance conscious local consumers.
Cost Structure			**Revenue Steams**	
Commodity procurement cost; Commodity transportation cost; Store rent; Wages, insurance and benefits of employees; Commercial marketing cost; Daily management cost. The cost of developing and maintaining retail store management information system, RFID (radio frequency identification) and closed circuit television (CCTV) supervisory system.			Store sales profit; Advertising profit.	

Figure 5: Business Model Canvas of Urban Neighbourhood Ltd

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The value proposition of Urban Neighbourhood Ltd is to provide convenient general merchandise purchase services for residents of local communities such as groceries. Under the existing business model, Urban Neighbourhood Ltd has the following key partnerships: (i) Express companies A and B that provide freight transportation services for the company (ii) Local real estate companies that provide stores and warehouse buildings for the company. (iii) Technology company C, which provides RFID technology and retail store management information system for the company. (iv)Technology company S, which provides Closed Circuit Television (CCTV) Supervisory System for the company. (v)Numerous suppliers providing commodities for the company. The actual name of the key partners were anonymise with the request from the management of Urban Neighbourhood Ltd. Meanhwile, the key activities are (i) Offline sales services. (ii) Supply chain management, including commodity procurement, transportation management and warehouse management. (iii) Customer service, including returning and replacing unqualified goods for customers. The key resources of Urban Neighbourhood Ltd are closely related to the company's sales activities. The company's key resources are as follows: (i) Warehouse/store (ii) Human resources i.e employees including management staff (iii) Retail store management information system (iv) RFID (radio frequency identification) technology (v) Closed circuit television (CCTV) supervisory system.

The cost structure of Urban Neighbourhood Ltd include (i)Procurement cost of goods purchased by the company. (ii) Freight transportation cost (iii) Rental of store (iv) Wages, insurance and welfare of employees (v) Business marketing expenses, such as the cost of physical advertising and irregular promotional activities. (vi) The cost of developing and maintaining retail store management information system, RFID (radio frequency identification) and closed circuit television (CCTV) supervisory system. (vii) Daily management cost of the company, including enterprise taxes, water and electricity charges and other miscellaneous expenses of the company.

Based on the conversations with the employees, Urban Neighbourhood Ltd adopts ‘personal -assistant’ type of relatioship with the customers. Customers can express their needs to the employees in the store and obtain shopping suggestions. After purchasing the goods, if there is a problem with the quality of the goods, they can feedback to the employees and get the return service. In addition, customers can also come to the store to find the goods they want according to their own needs and check out at the counter. In this case, the interaction between the company and the customer is only based on the transaction, and no real relationship is established. As is, customers only interact disrectly with Urban Neighbourhood Ltd by visiting the store or order via telephone. Hence it is a direct channel to reach the customers.

The general merchandise or groceries offered by Urban Neighbourhood Ltd is targeting the mass market. Anyone can shop at the stores, because the company's business philosophy is to provide convenient general merchandise shopping services for residents of the local community without obvious advantages in other aspects, the company's customers are often local consumers who are sensitive to distance. Hence, market segment is mass market. Urban Neighbourhood Ltd's main source of revenue is the profits generated by selling goods in stores. Apart from that, the company also earn from advertising expenses paid by some commodity suppliers. In order to promote their products, suppliers of some commodities often pay some advertising fees to the company and let the stores place these commodities in prominent recommended positions.

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Results of Business Model Analysis

Descriptive Statistical Analysis of Questionnaire

A total of 327 responses were recorded from the 400 questionnaires distributed. Data cleaning were performed before data analysis, some unnecessary attributes and data were deleted, and some abnormal samples were removed. First, descriptive analysis was conducted to understand the distribution characteristics of the respondents. Table 1 provides the proportion of respondents of all ages. 69% of respondents are over 30 years old. Since this questionnaire adopts a convenient sampling method, it may also means that the existing customers of Urban Neighbourhood Ltd are mainly people over 30 years old.

Table 1: The Proportion of Respondents of All Ages

Age	Proportion
Under 18 years old	20%
Between 18 and 30 years old	11%
Between 31 and 45 years old	34%
Between 46 and 65 years old	26%
Above 65 years old	9%

Table 2 shows the gender ratio of the respondents. According to the table, 53% of the respondents were men and 47% were women. Therefore, the gender distribution of the sample is balanced. Gender doesn't have a biased impact on the results of the questionnaire.

Table 2: The Proportion of Respondents of Gender

Gender	Proportion
Female	47%
Male	53%

Table 3 provides the proportion of respondent's attitude toward the statement in Likert Scale questions. In the analysis, if there are more respondents with negative views than positive views on a question means the majority of respondents have a negative attitude towards the question. According to Table 3, the main attitudes of most respondents to these questions was obtained. Most consumers hold negative views on the following ten aspects of Urban Neighbourhood Ltd: shopping channels, the classification and placement of commodities, return service, commodities supply, delivery service, business hours, popularity of promotional activities, accessibility of the services, epidemic prevention work and queue time. In addition, most respondents do not want to reduce offline stores after opening online channels.

Table 3: The Proportion of Respondent's Attitude Toward the Statement in The Questions.

Likert Scale questions	Very negative	Negative	Neutral	Positive	Very positive
Willingness to consume.	20%	30%	20%	16%	14%
Open online sales channels.	6%	7%	19%	32%	36%
Reduce offline stores after opening online channels.	30%	20%	30%	11%	9%
Shopping guide service.	6%	10%	19%	30%	35%

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Classification and placement of commodities	18%	20%	32%	15%	15%
Return service	15%	23%	35%	15%	12%
Commodities supply	10%	23%	39%	16%	12%
Delivery service	19%	27%	24%	16%	14%
Business hours	20%	25%	26%	16%	13%
Degree of attention to promotional activities	30%	20%	20%	17%	13%
The accessibility of the services.	20%	20%	27%	17%	16%
Degree of satisfaction with the promotional activities	10%	15%	29%	26%	20%
The cleanliness of stores.	20%	30%	20%	16%	14%
Epidemic prevention	23%	24%	23%	18%	12%
Payment channels	9%	7%	22%	34%	28%
The prices of the commodities	10%	15%	25%	26%	24%
Queue time	18%	25%	27%	16%	14%

Correlation Analysis of Questionnaire

Chi-square test and Spearman's rank correlation coefficient test were used for correlation analysis of questionnaire. In the choice of the test method, when the theoretical frequency $T<5$ is less than 20% and the total sample size $n\geq40$, the researchers only conduct the Pearson's chi-squared test. When the theoretical frequency $T<5$ exceeds 20% or $T<1$, the results of chi-square test are not credible, and the researchers choose to use Spearman's rank correlation coefficient test for correlation analysis. In the Pearson's chi-squared test and Spearman's rank correlation coefficient test, if Significance (2-sided) < 0.05, the null hypothesis is rejected, indicating that the two variables are significantly related(Machová, Korcsmáros, Esseová, & Marča, 2021).

Table 4 provides the results of correlation analysis of various attributes of questionnaire data. The results of correlation analysis show that the influencing factors related to the performance of Urban Neighbourhood Ltd are as follows: age, shopping channels, shopping guide service, the classification and placement of commodities, return service, commodities supply, delivery service, business hours, popularity of promotional activities, accessibility of the services,quality of promotional activities, cleanliness of stores, epidemic prevention work, payment channels, prices of the commodities and queue time. In addition, it is worth noting that the age of the respondents is positively correlated with responses' willingness to consumption. This means that the younger the customer, the more dissatisfied with the current business model of Urban Neighborhood Ltd.

Table 4: The Results of Correlation Analysis of Various Attributes with Respondents' Willingness to Consume

Attributes for analysis	**Chi-square test**			**Spearman's rank correlation coefficient test**
	Percent of T<5.	Minimal T	Sig.(2-sided)	Sig.(2-sided)
Gender & respondents' willingness to consume	0	19.74	0.913	
Age	12%	3.78	<0.01	

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Shopping channels	32%	2.52	<0.01	<0.01
Shopping guide service	24%	2.52	<0.01	<0.01
Classification and placement of commodities	0	6.30	<0.01	
Return service	0	5.04	<0.01	
Commodities supply	8%	4.20	<0.01	
Delivery service	0	5.88	<0.01	
Business hours	16.7%	0.14	<0.01	<0.01
Popularity of promotional activities	0	5.46	<0.01	
Accessibility of the services	0	6.72	<0.01	
Quality of promotional activities	8%	4.20	<0.01	
Cleanliness of stores	0	5.88	<0.01	
Epidemic prevention work	0	5.04	<0.01	
Payment channels	24%	2.94	<0.01	<0.01
The prices of the commodities	8%	4.20	<0.01	
Queue time	0	5.88	<0.01	

Conclusion of Business Model Analysis

According to the results of correlation analysis, 16 factors such as age, shopping channels and shopping guide service are related to respondents' willingness to consume. According to the results of descriptive statistical analysis, most of the respondents have a negative attitude towards Urban Neighborhood Ltd's 10 aspects including shopping channels, commodities supply and return service. In this research, the factors that most respondents hold negative attitudes and are related to respondents' willingness to consume are considered as the main factors affecting the company's performance.

To sum up, after business model identification and business model analysis, it can be concluded that in order to get rid of the adverse effects of COVID-19, Urban Neighborhood Ltd should use digital means to improve (i)customer segments by attracting more young customers. (ii)shopping channels (iii)classification and placement of commodities. (iv)return service. (v)Commodities supply (vi) Delivery service (vii) Accessibility of the services (viii) Popularity of promotional activities (ix) Business hours (x)Epidemic prevention work (xi) Queue time

Business Model Redesign

Based on the conclusion obtained above, the new business model is proposed using the business model canvas as shown in Figure 6. The parts in bold italics are the differences between the new business model and the current business model. In order to respect the rights and interests of the companies in all aspects, the key partners in the new business model were anonymous and referred to in English capital letters.

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<table>
<tr>
<td>Key Partners

Express companies;
Real estate companies;
Suppliers;
Technology company S;
Technology company C;
Distribution companies;
Internet company M;
Technology company D;

Technology company H;
Technology company N;
Tiktok; Xiaohongshu (RED);
WeChat; Microblog; Baidu.</td>
<td>Key Activities
Conventional offline sales;
Customer service;
Supply chain management;
Offline unmanned sales;
Online sales service;
Marketing activities (mainly online marketing).

Key Resources
Stores; Employees; Retail store management information system; RFID;
Self-checkout system;
CCTV supervisory system;
Intelligent entrance guard system; intelligent shopping guide system; Supply chain management system.</td>
<td>Value proposition

provide convenient general merchandise and fast moving consumer goods(FMCG) purchase services for local consumers.</td>
<td>Customer Relationships

Personal Assistant (PA);
Transactional;
Communities.

Channels
Direct:
Stores;
Company official website.
Indirect:
partners' shopping platforms and social networking sites</td>
<td>Customer Segments

Mass market;
Distance conscious local consumers;
Convenience conscious local consumers</td>
</tr>
<tr>
<td colspan="3">Cost Structure
Commodity procurement cost; Commodity transportation cost; Store rent; Wages, insurance and benefits of employees; Commercial marketing cost; Daily management cost;
The cost of developing and maintaining retail store management information system, RFID (radio frequency identification) , closed circuit television (CCTV) supervisory system, self-checkout system, intelligent entrance guard system, intelligent shopping guide system and Supply chain management system.
Cost of goods delivery.</td>
<td colspan="2">Revenue Steams

Profit from regular offline sales
Advertising profit.
Profits from unmanned sales.
Profit from online sales.</td>
</tr>
</table>

Figure 6: The Proposed New Business Model

According to the existing technology and research, the researchers put forward feasible improvement program for 11 aspects of Urban Neighborhood Ltd that should be improved. The specific improvement program in the proposed new business model are as follows.

1. Customer segments. Adding online shopping channels, unmanned settlement services and intelligent shopping guide services can enable Urban Neighborhood Ltd to attract a wider range of customer groups(Timotius & Octavius, 2021). For example, students, young white-collar workers and tourists. These customer groups have sufficient consumption capacity and have a great demand for fast moving consumer goods and daily general merchandise. Generally speaking, these customer groups attach great importance to the convenience of shopping due to work or study. Therefore, increasing the convenience of the company's services can effectively attract these customer groups.

2. Shopping channels. During COVID-19, more and more consumers are used to buying various goods online. Therefore, Urban Neighborhood Ltd needs to increase online shopping channels to meet the needs of consumers(Wang et al., 2020). Adding online shopping channels can not only make it easier for customers to buy goods, but also expand the accessibility of services provided by stores, thus attracting more customers for stores. In the post epidemic period, online shopping can also provide customers with goods through non-contact way, which can reduce some consumers' concerns about COVID-19.

3. The classification and placement of commodities. There are two possible reasons why customers are dissatisfied with the classification and placement of goods. One is that the classification and placement of goods are unreasonable. Another possible reason is that customers need more shopping guide services. The increase of shopping guides will greatly increase the cost, so it will be the best way to use information technology to provide shopping guides. The intelligent shopping guide system can help customers query the location of different types of goods and the catalog of different types of goods(Yang, 2016). The shopping guide system for supermarkets has been a mature technology and has been widely used. Customers can use the intelligent shopping guide system through the touch screen.

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4. Return service. Improving return services is beneficial for increasing customer satisfaction and thus improving the company's performance(Rushi & Pradhan, 2022). The return service can be improved by improving the retail store management information system. According to conversations with the retailer's clerk, the main reason why customers are dissatisfied with the return service may be that many customers do not take their receipts after shopping, or they do not keep them properly. This may cause them to be rejected because they cannot provide proof of purchase when requesting return. Possible solution is to collaborate with key partner i.e technology company which provides retail store management information system, to strengthen retail store management information system, so that shop assistants can easily query the time and payment information of each order. In this way, the clerk can judge whether the customer applying for return meets the return requirements by comparing the order information with the customer's personal information.

5. Commodities supply. As the sales volume of many commodities fluctuates greatly, the purchase of goods in the storefront of Urban Neighborhood Ltd is often inconsistent with the actual sales. This has led to the possibility that some goods may be out of stock for a short time. The company can strengthen cooperation with their key partners to develop and use a supply chain management system to manage the supply chain(Zhang et al., 2021). The company can use the supply chain management system to monitor the whole supply process of goods, and suppliers cooperating with the company can also use the supply chain management system to monitor the inventory and sales of goods in stores. In this way, The company can cooperate with suppliers to make a more reasonable replenishment strategy.

6. Delivery service. During the COVID-19 pandemic, delivery service has a significant impact on consumer purchasing behavior, and improving delivery speed and accuracy can enhance customer satisfaction(Wang et al., 2020). In the existing business model, Urban Neighborhood Ltd has only one delivery method. After customers have telephoned to order goods, the employees in the store will deliver the order. Due to the single distribution channel, when the number of orders to be distributed is large, the shop assistants will be unable to complete the distribution in time. Therefore, in order to improve this situation, the company can cooperate with distribution companies that can provide local distribution services and use online channels to accept advanced order. When there are not enough people in the store to complete the delivery of the order, the order can be delivered to the distribution companies of the cooperation. In this way, the company can maximize cost savings while improving delivery services.

7. Queue time. Queuing time has an important impact on customer satisfaction(Brandtner et al., 2021). The reason why consumers are dissatisfied with the queuing time is that in the rush hours of shopping, employees cannot meet customers' needs at the checkout speed. However, simply increasing the number of clerks will lead to excessive costs. Therefore, Urban Neighborhood Ltd can use the self-service checkout counter mentioned above to help the clerks share part of the settlement work. Self checkout system is a key technology for implementing self service checkout counters.

Self-checkout system can help customers scan the RFID tags of the goods to be purchased at self-checkout counter and make electronic payments. After the customer completes the payment, self-checkout system will change the content of the RFID tag to unlock the restrictions for these commodities(Fu, Li, & Yuan, 2016).

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8. Accessibility of the services. The company can solve this problem in two ways: 1. Use online sales channels to expand the accessibility of services that the store can provide. 2. Decide whether to open more stores or unmanned stores according to the specific market demand of different regions. More stores will also improve the accessibility of the company's services. Electronic article surveillance technology and self checkout system are key technologies for achieving unmanned retail stores. Electronic article surveillance(EAS) is a technical method used to prevent theft in retail stores. A common way of this technical method is to use RFID tags to prevent theft. The merchant affixes an RFID tag to each item(Zahid, Jiang, Rafique, & Eric, 2020). When the customer completes the checkout, the retail store management information system will change the content of the RFID tag and remove the restrictions on the commodities. Detectors for detecting RFID tags are placed at the door of the store. If the commoditiess with RFID tags that have not been unlocked are brought to the door, the detectors will read the contents of the tags and determine that there are commodities that have not been checked out. Urban Neighborhood Ltd can collborate with key partner that to realize Electronic article surveillance.

9. Business hours. The main reason for consumers' dissatisfaction with Urban Neighborhood Ltd's business hours is that the company's business hours do not fully cover consumers' consumption time. The company is closed before 8:00 am and after 9:00 pm. However, with the development of the economy, more and more consumers have the demand for night consumption in China(Song, 2019). Therefore, consumers' dissatisfaction with the company's opening hours is likely to be due to the fact that many young consumers cannot shop in the early morning and late at night. So the company needs to extend the business hours as much as possible to increase sales under the premise of saving costs. The company can work with technology companies to develop and use unmanned retail models to keep stores open at night and early in the morning. The following technologies help retail stores achieve unmanned sales at night: Electronic Article Surveillance (EAS) technology, intelligent entry guard, self checkout system, and Closed Circuit Television (CCTV) Supervisory System

10. Popularity of promotional activities. The low popularity of the promotional activities of Urban Neighborhood Ltd is mainly because the company mainly uses traditional entity marketing methods for marketing. However, in the case of less marketing funds, the marketing effect of traditional marketing methods is often very poor. Therefore, the company can increase digital marketing channels for marketing and monitor the effect of digital marketing(Lehdonvirta, 2013). The company can also open their official website to let customers know their brand. Moreover, the official website also helps to attract more potential partners. The company can conduct digital marketing by using some marketing media including social media, search engines and comment websites with a large number of active users in China. These marketing media include Tiktok, Microblog, WeChat, Baidu and Xiaohongshu (RED), etc.

11. Epidemic prevention work. People have various concerns about epidemic prevention and control. Governments across China have made clear requirements and provided technical support for epidemic prevention measures in public places(Cavolo, 2020). Urban Neighborhood Ltd can improve epidemic prevention and control by strictly complying with SOP for epidemic prevention and using epidemic prevention APP provided by local epidemic prevention department. The retailer can also strengthen cleaning and disinfection work, especially in high contact areas such as cash registers, shelves, and shopping carts. Apart from

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that, the retailer can also provide disinfectant and tissues, and encourage customers to use them before entering the store to ensure the hygiene and safety of the store environment. In addition, the retailer can develop a digital dashboard of local epidemic to show customers the dynamic situation of local epidemic. The data in the digital dashboard can be obtained from the official release of the local epidemic prevention department.

New Business Process

The sales process is the core business process of Urban Neighborhood Ltd, so this section improved and redesigned the sales process according to the main factors affecting the company's performance and the new business model proposed in the previous chapter.

Process Identification

At this stage, the sales process of Urban Neighborhood Ltd was identified. The result of the sales process is that the goods are sold successfully or the sale is cancelled. Under the existing business model, for the company, the beginning of the sales process is to receive the customer's reservation or settle the customer's goods, and the end of the sales process is the employee's record of this transaction. For the customer, the beginning of the sales process is the customer's goods selection, while the end of the sales process is the customer's payment or abandonment of the transaction. According to the conclusion obtained from the questionnaire analysis, the main problems faced in the sales process are too few sales channels, too few delivery channels and too long queue time at checkout when selling in stores. The measured value of the sales process is as follows: 1. Improve the quality of the sales process. 2. Improve the time to complete the cycle of the sales process.

Process Discovery

As shown in Figure 7, according to the results of preliminary analysis, the researchers defined the sales process of Urban Neighbourhood Ltd by the As-is process model.

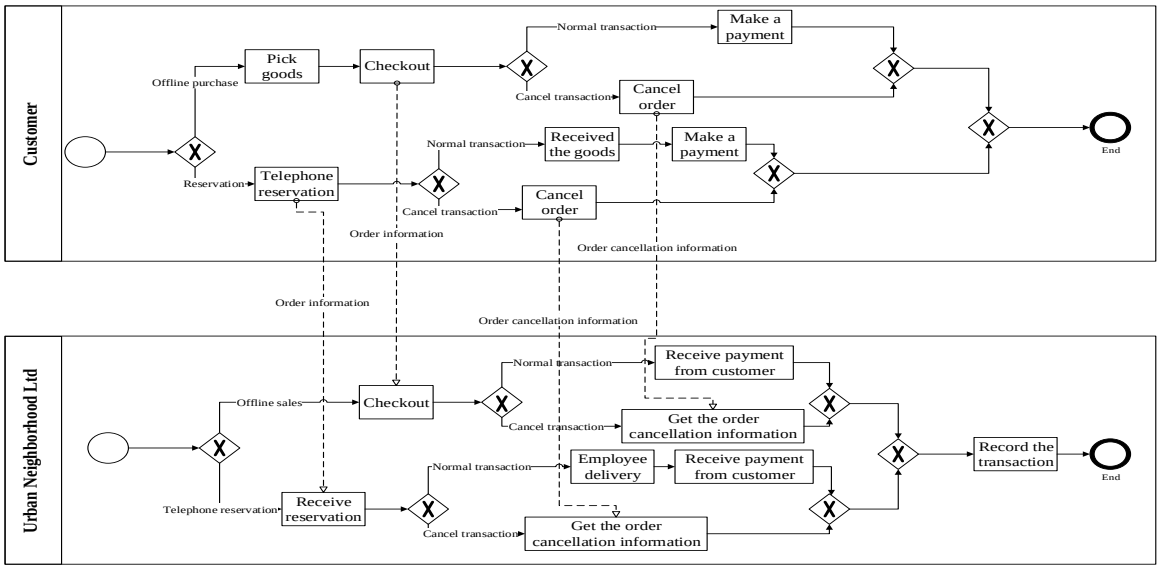

Figure 7: As-is Process Model of Sales Process

According to the As-is process model, the sales process of Urban Neighborhood Ltd in the existing business process is as follows: Customers can choose to order by phone or purchase

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goods in the store. When the customer purchases goods in the store, the customer can check out and pay at the counter after selecting the goods to complete the transaction. After the amount has been settled, the customer can also choose to cancel the transaction. If the customer chooses to order by phone, after the store accepts the order, the clerk will deliver the goods to the customer's designated place and charge the order fee to complete the transaction. Customers can notify the store to cancel the order before the clerk delivers.

Process Analysis

The As-is process model shows that under the existing business process, the sales channel and distribution channel of the sales process of Urban Neighbourhood Ltd are single, and the automation is low. According to the main factors affecting the company's performance and the new business model, the existing sales process can be improved by the following ways: 1. Cancel the outdated telephone order channel. The company can cooperate with existing online retail platforms to increase online sales channels. 2. Cooperate with distribution companies to increase delivery channels to improve service quality. 3. Use the self-checkout system to reduce the queuing time of customers at peak hours.

Process Redesign

As shown in Figure 8, the sales process was defined by the To-be process model according to the results of process analysis.

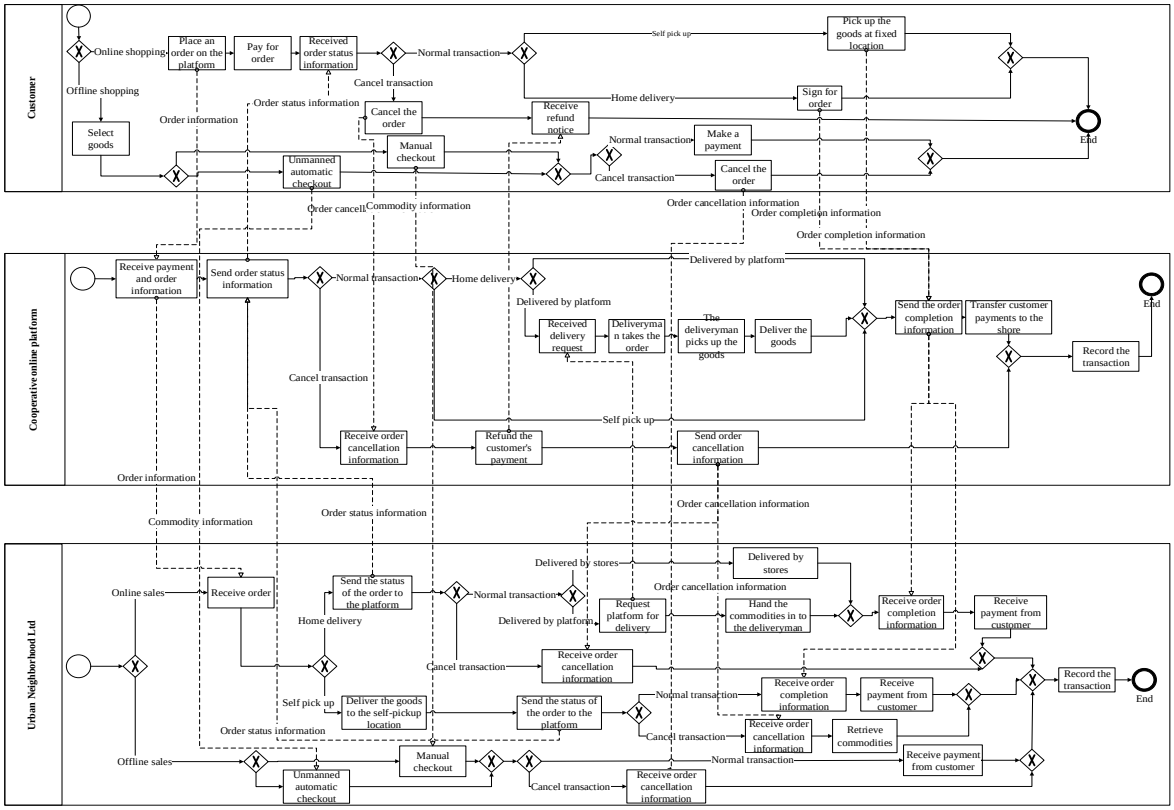

Figure 8: To-be Process Model of Sales Process

In the new sales process, consumers can choose to shop online or offline. If consumers choose to shop online, after the consumer places an order and pays on the platform, the stores will receive the order information sent by the platform.

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If the customer chooses to pick up the goods themselves, the store will pack the goods and send them to the fixed pickup location. Then, the store will post the status of the order on the platform. After receiving the notice, the customer can go to the fixed pickup location to pick up the goods. Once the customer picks up the goods, the platform will notify the store and the customer's payment will be transferred to the store. If customers requests home delivery, the store will consider whether to request the platform for delivery based on the real-time manpower allocation situation. If the store requests the platform to deliver, the deliveryman will then go to the store to pick up the order packaged by the store and deliver it. After the customer gets the goods and signs for the order, the platform notifies the store and transfers the customers' payment to the store, and the transaction is over. The customer can cancel the order before receiving the goods, then the platform will notify the store to retrieve the goods and return the customer's payment, and the transaction ends.

If customers choose to consume in the stores. After selecting the goods consumers want to buy in the store, they can choose to go to the self-checkout counter for automatic checkout, or they can choose to go to the manned counter to let the clerk check out. After checkout, consumers can choose to pay or cancel the transaction to end the transaction.Whether the transaction is successfully completed or not, the store and platform will record the transaction, and the whole process is over.

Conclusion

Against the backdrop of the impact of the COVID-19 pandemic on the retail industry, Wang et al. (2020) put forward the following retail management recommendations: increasing online sales channels, increasing self-service checkout machines, enhancing the quality of delivery services, improving epidemic prevention measures, improving business hours, improving commodities supply, and using promotional activities to attract customers. And Keller (1993) found that increasing the popularity of promotional activities can effectively improve the effect of promotional activities. The findings of this research confirm that the aforementioned factors do indeed help improve consumers' willingness to consume. Furthermore, this research proposes specific digital improvement plans for the above factors.

The research results of Timotius and Octavius (2021) show that the young generation of consumers has strong purchasing power and retailers should integrate online and offline sales channels into omni-channels instead of replacing each other. These are consistent with the findings of this research, which also proposes digital solutions for achieving omnichannel sales. Rushi and Pradhan (2022) found that the accessibility of services and return service are significant factors that influences consumer purchasing behavior. The results of this research confirm the conclusions of Rushi and Pradhan (2022), and propose using unmanned sales models and online sales channels to improve the accessibility of retailers' services.

Brandtner et al. (2021) found that placement of commodities and queue time are all important factors affecting consumer satisfaction. This research is in agreement with the research results of Brandtner et al. (2021). Furthermore, this research proposes digital solutions to improve these factors as part of a new business model.

The findings from this research can help Urban Neighborhood Ltd to carry out digital transformation and reduce the negative impact of COVID-19. Apart from that, it also contribute

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to the literature in business model process and digital transformation, and enrich the development of business informatics. The limitation of this research is that it does not provide a new business model implementation plan and specific implementation steps for the management of Urban Neighbourhood Ltd due to time and resource constraints. For future research, the researchers can evaluate the cost and risk of implementing the new business model and propose specific implementation plans. This research is only based on the case of Urban Neighbourhood Ltd, but the specific situation of different retailers and different regions is different. Therefore, it is difficult to extend the research results of this research to the overall scope of retail industry.

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