

A Study on Satisfaction Factors of Customers of Vegetable Retail Platforms

Yumei Weng*, Lanthom Jonjoubsong

Faculty of Business Administration, Huachiew Chalermprakiet University

*Email : 328202229@qq.com

Abstract

Providing customers with a satisfactory consumer experience is an important task for vegetable platforms. To expand market share and gain a competitive advantage over competitors, which is closely related to the survival and development of the company, vegetable retail platforms must consider customer satisfaction and satisfy them with innovative solutions. The platform has a good policy environment in the past development, but still faces bottlenecks in the development process, such as the logistics layout of the platform and unreasonable platform design. For the vegetable retailing platform, how to improve customer satisfaction so that the platform can provide better service and quality for customers becomes the development goal of the vegetable retailing platform.

The environmental factors of vegetable retailing platforms explored include scale, price, cross-regional, platform design, security, and logistics. This study uses a survey method for quantitative research. Multiple regression analysis was used to study customer satisfaction. The data was studied using a set of collected questionnaires and measured using a five-point Likert scale. Finally, the data collection for this study was designed as a questionnaire for 400 customer satisfaction surveys.

Keywords : Vegetable retail platform, Platform service, Platform quality, Customer Satisfaction

1. Introduction

Since 1995, the comprehensive spot network of Zhengzhou Commodity Exchange (later renamed as "China Grain Network") opened online grain trading. Then, after more than 20 years of development, agricultural products have become the fourth major e-commerce boom, following the three major e-commerce booms of clothing and commodities. In the first stage of startup, e-commerce was concerned with trading through the Internet. The second phase was the growth phase, where companies began to integrate their core business processes and to build relationships among employees, suppliers and partners. The third phase was the stabilization phase, where e-businesses managed themselves through technologies, such as connecting, adapting, integrating and repairing their IT systems. They focused on their core business development. Meanwhile the fourth stage is the mature stage, where e-commerce is free from the traditional sales model and communicates with users at a deeper level from multiple perspectives, such as active, interactive, and user care. Several outstanding enterprises have emerged, such as Shanghai Grain Butler, COFCO I Buy, Shunfeng Express, Daily Orchard, etc. In 2014, the online retail sales of agricultural products were valued at about 100 billion yuan (Li and Wang, 2022). The rapid development of agricultural products e-commerce has greatly influenced people's living habits and changed the way consumers obtain vegetables daily, from physical store purchases to online orders and offline delivery. It has realized the consumers' desire to enjoy food from all over the world without leaving home. Which not only saves time but also increases the variety of choice and greatly improves convenience. In the past, vegetable trading is mainly based on traditional physical operations. With the development of information technology and the wide spread of network facilities, especially the promotion of mobile terminals, consumers can

now purchase vegetables through online retailing platform. In this case, e-commerce enterprises and traditional enterprises have been involved in the huge vegetable market, making the competition very fierce. Because of this, improving customer satisfaction is detrimental for e-commerce enterprises to gain the competitive edge above others.

After vegetables are traded online, the big data platform can capture effective information and analyze consumers' preferences, thus helping operators to adjust the price and other factors of the vegetable retail platform to prompt consumers to buy. The construction of vegetable retail platform can promote the development of agricultural products e-commerce platform, prompting the transformation of traditional agriculture to the Internet, making it more informative, standardized and branded, thus further promoting the development of social economy. According to 2020 data from HEMA, for example, the flow of HEMA APP continues to grow, online orders increased by 290% compared to the same period last year; professional vegetable retail platform has become fashions, and some traditional supermarkets also use online shopping platform, vegetable retail platform third party platform to expand the online retail of vegetables as well as agricultural products, to achieve offline customer diversion to online, the number of clicks and orders also achieved a doubling. As an effective marketing method, the Internet has greatly facilitated the development of vegetable retail platforms. For example, HEMA vegetable retail platform has broadened product trading channels, eliminated information asymmetry, narrowed the distance between enterprises and customers, reduced transaction costs, and created high-quality products. However, the HEMA vegetable retail platform still faces many challenges: 1) in terms of platform services, the difficulty in standardizing products, high transportation and storage costs, and inconvenient cross-regional services, 2) in terms of platform quality, the platform scale is not large enough, the platform design and operation is cumbersome, and the platform security is not high (Wang, Zhuang and Wu, 2018). Moreover, customer awareness of the market is still lacking and business services requires improvement; leading to hindered e-commerce operations.

Customer satisfaction is the most effective means for creating value and revenue for e-commerce companies. It is the cornerstone of an e-commerce company's success in a highly competitive marketplace. Therefore, if vegetable retail platforms want to maintain a competitive advantage in the market, they must understand the needs of their customers and create a consumer experience that satisfies them.

This study will explore the factors influencing customer satisfaction in vegetable retailing platforms in relation to the products and services they provide to improve customer satisfaction.

2. Objectives

- 1) To determine the impact of online vegetable retail platform services on the satisfaction of customers.
- 2) To determine the impact of online vegetable retail platform quality on the satisfaction of customers.

3. Literature review and theoretical framework

(1) Literature review

China vegetable retail platform

In 2005, fresh produce began to be traded online. Since produce was initially sold on online platforms, most online shopping platform companies did not have sufficient

experience in running websites. As a result, most vegetable retail platforms, including Alibaba, Taobao, and Jindong, collapsed in 2012. Since then, additional specialized vegetable retail services or platforms have started to operate. Vegetable retail platforms are platforms that provide customers with Internet-dependent services and enable them to buy the products they desire. In this process, several companies related to B2C, C2C, O2O, and other agricultural e-commerce models have also launched vegetable retail services or platforms.

Therefore, vegetable retail platforms in China are not independent platforms, but can also be affiliated services or platforms with specialized shopping websites. The retail platforms in China are mainly in the presence of the following major shopping websites.

Platform services :

A. High quality products

With the continuous improvement of production levels, consumers are not satisfied with the variety of vegetables, and the quality standards of vegetables put forward higher requirements. High-quality vegetable products refer to whether the vegetables are fresh when customers receive them, whether the packaging is broken, and whether the quality of the vegetables should be guaranteed by the suppliers chosen by the vegetable retail platform before the vegetables are put on the shelves. Therefore, the active research and production of high quality vegetables is a major test facing the current vegetable retail platform (Chan, Liu and Zhang, 2018).

B. The logistic service

Logistics service quality is a special kind of service quality and its impact on satisfaction is an area of interest for scholars. Collier and Bienstock (2015) verified in their respective logistics service quality models that logistics service quality has a positive impact on customer satisfaction. It has been noted that logistics service quality can create logistics value and thus contribute to customer satisfaction through logistics services. Fuentes-Blasco, Moliner-Velázquez and Gil-Saura (2014), using the airline industry as a study, they pointed out that airline logistics can increase delivery value, knowledge innovation value, value of value-added services, information value, and performance satisfaction value, resulting in an increase of overall customer satisfaction.

C. Cross-region services

Cross-regional means that sales are made from more than one region during the sales process, so they are cross-regional. From the customer's point of view, customers can buy more items and have more choices through this vegetable retailing platform. It brings time convenience to customers (Feng and Wu, 2013).

D. Prices of services

Online customer satisfaction is influenced by size, and cost (Li and Hu, 2015). Size refers to the structure, form, or scope of the business. Price/cost refers to the consumer expenditure that buyers need to pay when making a transaction.

Quality of platform

A. Platform scale

The current transaction scale of vegetable retail platforms in China is 518.8 billion yuan, with a higher growth rate than other types of e-commerce platforms and a rising trend year by year. Therefore, the platform with larger capital scale is more likely to win the favor of consumers. More and more consumers are choosing to buy vegetables on vegetable retail platforms. It can be seen that due to the word-of-mouth effect, the larger scale vegetable retail

platform will attract more customers and more potential consumers. This also influences the customer satisfaction to some extent. (Ai, 2011).

B. Platform design

Platform design refers to the design as well as the layout of the pages and the layout of the latest vegetable information on the platform. Customers can easily navigate and operate the vegetable retail platform when purchasing. A simple and convenient platform design will prompt consumers to enhance their shopping experience on the vegetable retail platform, and facilitate the operation of the customer with a more concise and faster shopping process (Zhang, 2019).

C. Platform security

Security refers to the security of the platform during the payment process and the security of the user's private information when shopping. A secure shopping platform can attract more consumers, the platform has no loopholes, and protects customers' privacy, transfer and account security. This will to a certain extent encourage consumers to make multiple purchases and improve consumer satisfaction (Liao, 2016).

(2) theoretical framework

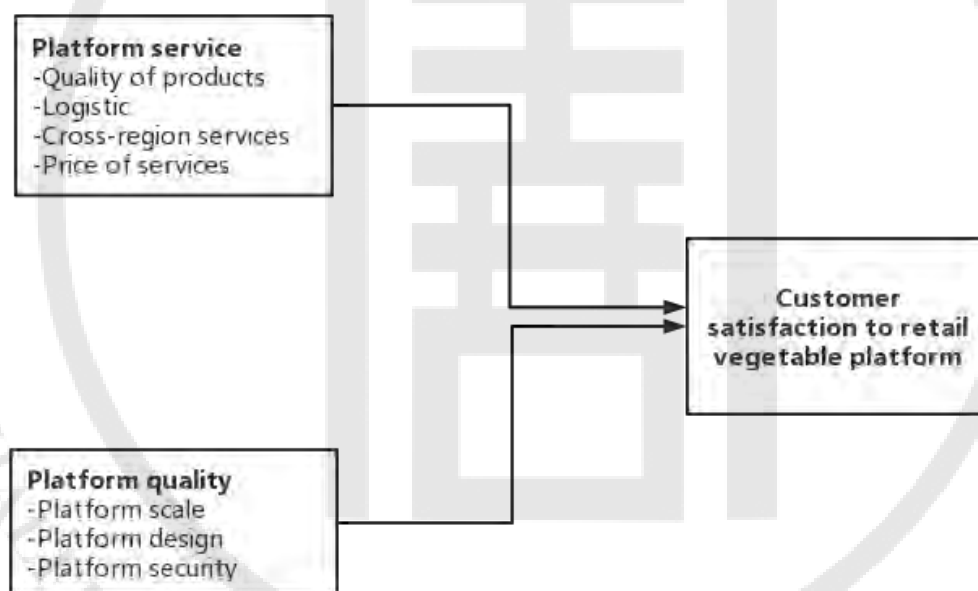


Figure 1 Theoretical framework

4. Research methodology:

4.1 Quantitative research method

This study uses quantitative research by utilizing the survey method, which is generally conducted to obtain statistical results on a particular research subject as a whole. In quantitative research, information is represented by some kind of numbers. When these numbers are processed and analyzed, it is necessary to first clarify according to what scale this information data is measured and processed. S. S. Stevens classifies scales into four types, namely, nominal, ordinal, interval, and ratio.

Survey method is a widely used method in social survey at home and abroad. Survey method refers to the form used for statistics and surveys to express questions in the form of a survey questionnaire. Because of its controlled characteristics, survey method is used by researchers to measure problem under study, while at the same time also collect reliable data. Survey method is distributed mostly by mail, individual distribution, collective distribution, and other multiple other ways. Upon received, the surveyors will fill in the answers according to the questions in the form. Comparing to other methods such as the interview, the survey method is more detailed, and easier to control.

The main advantages of survey method are its standardization and low cost. For a survey to be well-designed tool for investigation, its design should be standardized and measurable.

Population and sample

Population : In this study, Chinese customers who purchase vegetable products on different Internet platforms in China will be studied. Based on aggregated online data, the number of users who purchase vegetables on Chinese Internet vegetable retail platforms is approximately 400 million (Wei and etal, 2020).

Sample:

(1) Sampling techniques

Samples will be selected with cluster sampling in order to get representative of large population. To ensure the representativeness of the sample from different regions of China, the sampling techniques will divide population into four clusters—East, West, South and North of China for sampling.

(2) Sample size

Regarding the number of population for this study mentioned above, researcher used the sample size calculation of Chaokromthong and Sintao (2021) (see Figure 2) with a confidence level of 95% (giving a marginal error of 0.05), thus the sample size for this study is 400 vegetable retail platform customers which will be allocated to every region for 100 samples.

$$\text{Formula: } n = N / (1 + N * e^2)$$

n = sample size

N = the population size

E = the margin of error

Figure 2 formula for samples calculation (Adam, 2020)

4.2 Data gathering methods

The data throughout this study are collected using a set of questionnaires and measured using a five-point Likert scale. With the results being easy to quantify, the questionnaire method saves time and human resource which allows for better allocation purposes. A questionnaire is a structured survey with a fixed form of expression for the survey questions, the order of the questions, and the manner and method of answering the questions; therefore, there is no subjective bias by any individual, researcher, or investigator throughout the survey research. Moreover, the statistical results of the survey are also generally quantifiable (Watson, 2015).

The questionnaire is composed of three parts. The first part of the questionnaire is the general information of samples in order to ensure that the samples are qualified. The second part is the samples' satisfaction over the vegetable retail platform service. The third part is the samples' satisfaction over the the quality of vegetable retail platform. The questionnaires are

online developed with Wenjuanxing website and will promote over popular social media in China, such as QQ, WeChat, and Weibo in order to get the enough samples.

4.3 Data analysis

The multivariate analysis method of regression analysis was used in this study. Regression analysis is performed by analyzing the collected data. Regression analysis is a statistical method of analyzing data to understand whether two or more variables are correlated with each other, the direction and strength of the association, and to develop mathematical models to examine specific variables to predict the variables of interest to the researcher (Feng, 2004).

4.4 Research quality

(1) Reliability

Reliability refers to the degree of consistency of the results obtained when the same object is repeatedly measured by the same method (Liu, Jiang, and Zhang, 2008). The questionnaire in this study had a scale that measures the internal consistency of the test. In order to test whether the design of the scale questions is reasonable and to effectively reduce the risk of failure in formal surveys, this study will make use of a professional data statistical software for data conducting. Lastly, the Cronbach's alpha coefficient test will also be used as a reliability test method.

(2) Validity

Validity analysis refers to the analysis of the scale expression to the accuracy of the measurement index (Jiang, Shen, Zhang, Liao and Xu, 2010). To ensure validity of the questionnaire, an expert from an internet-based platform has been asked to help verify the completed questionnaire. This expert has extensive experience in customer satisfaction research and will be providing professional advice on the design of the questionnaire.

(3) Ethical issues

The study was approved by the Ethics Committee of Huachiew Chalermprakiet University. The researchers have informed the committee on the purpose of the survey and ensured that their answers were confidential for the duration of the study. Thus, the introduction to the questionnaire would explain the meaning and importance of the study and its confidentiality. Respondents were informed that they could fill in the questionnaire as they wished. This section contains only general information to protect their answers from bias. Respondents' privacy was protected, and their identities were not revealed. Finally, the collected data were given without any tampering.

5. Results

5.1 Data of sample

The survey sample was drawn from the customer base of major vegetable retail platforms in China. A total of 431 online questionnaires were collected, of which 400 were from customers who had purchased vegetables from vegetable retailing platforms and 31 were from customers who had not purchased vegetables from vegetable retailing platforms. Therefore, 31 were invalid questionnaires, and 400 were used as the sample size for this study. Based on the sample size of 400 (see Table 1 below), it can be divided into four regions by area. They are 103, 124, 150, and 23 in East China, West China, South China, and North China, respectively. In percentage terms, they can be 25.75%, 31%, 37.5% and 5.75%, respectively.

Table 1 Data of sample

Region	Sample size (persons)	Percentage
East China	103	25.75%
West China	124	31%
South China	150	37.50%
North China	23	5.75%
Total	400	100%

5.2 Descriptive data

This section is descriptive data. It is divided into three parts. The first part is customers' expectations of vegetable retail platform services. The second part is the customers' expectation of the quality of the vegetable retailing platform. The third part is the analysis of the factors influencing satisfaction.

5.2.1 Expectation

This section summarizes customers' expectations of the vegetable retail platform in terms of service and quality. In terms of service expectations, it includes expectations about product quality, logistics, cross-regional services, and price services. In terms of quality, it includes expectations for platform size, design, and security. The descriptive results are shown in the table below.

Table 2 Summary of expectations in terms of platform services and quality (N=400)

Independent variable	Mean	Standard deviation
Expect the quality of the products when they arrive.	3.72	1.002
Expected logistics services	3.74	0.917
Expected quality of service across regions	3.61	0.984
Desired platform price service	3.54	0.963
Scale can influence the decision to choose a B2C platform	3.59	0.840
Platform design can influence the choice of a B2C platform	3.57	0.881
Platform security can affect the choice of a B2C platform	4.18	0.877

In terms of service expectations of vegetable retail platform customers (see Table 2), the expected quality of product arrival has a mean of 3.72 with a standard deviation of 1.002; the expected logistics service has a mean of 3.74 with a standard deviation of 0.917; the expected cross-regional service has a mean of 3.61 with a standard deviation of 0.984; the expected platform price service has a mean of 3.54 with a Standard deviation is 0.963; scale will affect the decision to choose B2C platform means is 3.59, the standard deviation is 0.840; platform design will affect the choice of B2C platform mean is 3.57, the standard deviation is 0.881; platform security will affect the choice of B2C platform means is 4.18, the standard deviation is 0.877. Therefore, platform security will affect the choice of B2C platform Expectations are high, followed by expected logistics services, expected quality of products when they arrive, expected cross-regional services, size of the platform, platform design, and platform price services.

5.2.2 Customer Satisfaction

Customer satisfaction with vegetable retail platforms in terms of service and quality. Satisfaction in terms of service includes satisfaction with product quality, logistics, cross-regional, and price services. In terms of platform quality, it includes satisfaction with platform size, design, and security. Descriptive results are shown in the table below.

Table 3 Summary of satisfaction in terms of service and quality (N=400)

Dependent variable	Mean	Standard Deviation
The quality of platform products	3.79	0.856
Platform logistics	3.86	0.862
Cross-region of the platform	3.78	0.846
The price of the platform	3.83	0.855
Platform scale	3.76	0.846
Platform design	3.81	0.848
Platform security	3.82	0.845

First, in terms of customer satisfaction with the services of the vegetable retail platform (see Table 3), the mean value of the product quality dimension is 3.79 with a standard deviation of 0.856; the mean value of the logistics dimension is 3.86 with a standard deviation of 0.862; the mean value of the cross-regional dimension is 3.78 with a standard deviation of 0.846, and the mean value of the price dimension is 3.83 with a standard deviation of 0.855. The satisfaction level of the logistics dimension is higher, followed by price, product quality, and cross-region respectively; in addition, the mean value of customer satisfaction with the quality of the vegetable retail platform is 3.76 with a standard deviation of 0.846; the mean value of platform design is 3.81 with a standard deviation of 0.848; the mean value of platform security is 3.82 with a standard deviation of 0.845. A mean value greater than 3 means high satisfaction. Therefore, in general, customers are satisfied with the service and quality of the vegetable retail platform.

5.3 Analysis of factors affecting satisfaction

This section provides an analysis of the factors that influence satisfaction. It is divided into two parts. The first section analyzes the impact of service aspects (product quality, logistics, cross-regional and price) of the vegetable retailing platform on satisfaction. The second section analyzes the impact of quality aspects of vegetable retailing platforms (platform scale, platform design and platform security) on customer satisfaction.

5.3.1 Impact of the vegetable retailing platform on customer satisfaction in terms of services.

In this section, regression analysis was conducted using statistical analysis software with the service aspects of vegetable retailing platforms (product quality, logistics, cross-regional and price) as the independent variables and customer satisfaction as the dependent variable.

5.3.1.1 Impact of product quality, logistics, cross-regional and price on customer satisfaction.

This section analyzes the impact of the vegetable retailing platform on customer satisfaction in terms of service. It includes product quality, logistics, cross-regional and price, and the results of the model fit test are shown in the table below.

Table 4 Impact of product quality, logistics, cross-regional and price on customer satisfaction

	β	t-value	P-value
Intercept	0.096	0.585	0.559
Product quality	0.198	4.287	0.000
Logistics	0.210	5.007	0.000
Cross-regional	0.136	3.008	0.000
Price of service	0.228	5.251	0.000

The results of the impact of Hema fresh vegetable retailing platform on customer satisfaction in terms of service are shown in Table 4. there is a positive effect between product quality ($\beta = 0.198$, $p < 0.05$) and customer satisfaction with vegetable retailing platform. There is a positive effect between logistics ($\beta = 0.210$, $p < 0.05$) and customer satisfaction with the vegetable retailing platform. There is a positive effect between cross-regional ($\beta = 0.136$, $p < 0.05$) and customer satisfaction with the vegetable retailing platform. There is a positive effect between price service ($\beta = 0.228$, $p < 0.05$) and customer satisfaction with the vegetable retailing platform. The regression equation is: $Y = 0.096 + 0.198 * \text{product quality} + 0.210 * \text{logistics} + 0.136 * \text{cross-regional} + 0.228 * \text{price service}$.

5.3.1.2 Summary the results on proposed hypothesis (Platform service)

In this section, the proposed hypotheses from vegetable retailing platforms in terms of product quality, logistics, opening area and price are presented. The results of the proposed hypotheses are then summarized.

(1) Hypothesis 1

The quality of the vegetable retail platform in terms of product quality, logistics, cross-regional and price has a positive impact on the satisfaction of the vegetable retail platform.

More specifically :

H1a: Product quality of vegetable retail platforms has a positive impact on customer satisfaction.

H1b: Logistics of vegetable retailing platform has a positive impact on customer satisfaction.

H1c: The cross-regional service of vegetable retailing platform has a positive impact on customer satisfaction.

H1d: The service price of vegetable retailing platform has a positive effect on customer satisfaction.

(2) Summary the results on proposed hypothesis (platform of services)

Table 5 Summary the results on proposed hypothesis (platform of services)

	H1a. Product quality	H1b. Logistics	H1c. Cross- regional	H1d. Price
Customer satisfaction	S	S	S	S

(Note S: Supported; NS: Not supported)

According to Table 4 and Table 5. there is a positive effect between product quality ($\beta = 0.198$, $p < 0.05$) and customer satisfaction in vegetable retailing platforms. Hypothesis H1a was supported. There is a positive effect between logistics ($\beta = 0.210$, $p < 0.05$) and customer satisfaction with the vegetable retailing platform. Hypothesis H1b was supported. There is a positive effect between cross-regional ($\beta = 0.136$, $p < 0.05$) and customer satisfaction with the vegetable retailing platform. Hypothesis H1c is supported. There is a positive effect between price service ($\beta = 0.228$, $p < 0.05$) and customer satisfaction with the vegetable retailing platform. Hypothesis H1d is supported.

5.3.1.3 ANOVA test for service factors of vegetable retailing platform

In this section, a one-way ANOVA will be used to investigate whether the service aspects of the vegetable retailing platform (product quality, logistics, cross-region and price) have a positive impact on customer satisfaction.

Table 6 ANOVA test for vegetable retail platforms in terms of service

	Multiple R	R ²	Adjusted R ²	F-value	P-value
Product quality					
Logistics					
Cross-regional	0.775	0.601	0.594	84.250	0.000
Price					

The variance test showed that $F=84.25$, $p<0.05$, Multiple R was 0.775, R^2 was 0.601 and adjusted R^2 was 0.594 (see Table 6). service aspects of Hema Fresh (product quality, logistics, cross-regional and price service) were used as independent variables. In the regression model, customer satisfaction was used as the dependent variable with statistical significance.

5.3.1.4 ANOVA results for vegetable retail platforms of service

This section will use the results of the presented one-way ANOVA to analyze whether the service (product quality, logistics, cross-regional and price) aspects of the vegetable retailing platform have a positive impact on customer satisfaction.

Table 7 ANOVA results for service factors of vegetable retailing platforms

	SS	df	MS	F-value
Regression analysis	124.693	4	17.813	84.251
Residual value	82.881	395	0.211	
Total	207.573	399		

Table 7 shows the results of the one-way ANOVA. Since $\alpha=0.05$, $p\text{-value} < 0.05$. From these statistics it is clear that Hema fresh vegetable retailing platform has a positive impact on customer satisfaction in terms of services (product quality, logistics, cross-regional and price services).

5.3.2 The impact of vegetable retail platforms on customer satisfaction in terms of quality

In this section, we performed a regression analysis using statistical analysis software, with the qualitative aspects of the vegetable retailing platform (platform scale, platform design and platform security) as independent variables and customer satisfaction as dependent variable.

5.3.2.1 Impact of platform scale, platform design and platform security on customer satisfaction

This section analyzes the impact of vegetable retailing platforms on customer satisfaction in terms of quality. It includes platform scale, platform design and platform security, and the results of the model fit test are shown in the following table.

Table 8 Impact of platform scale, platform design and platform security on customer satisfaction

	β	t-value	P-value
Intercept	0.041	0.168	0.867
Platform scale	0.145	3.120	0.000
Platform design	0.122	3.498	0.000
Platform security	0.122	2.999	0.000

The results of the effect of Hema fresh vegetable retailing platform on customer satisfaction in terms of quality are presented in Table 8. There is a positive effect between platform scale ($\beta=0.145$, $p<0.05$) and customer satisfaction with the vegetable retailing platform. There is a positive effect between platform design ($\beta=0.122$, $p<0.05$) and customer satisfaction with the vegetable retailing platform. There is a positive effect between platform security ($\beta=0.122$, $p<0.05$) and customer satisfaction with the vegetable retailing platform. The regression equation is: $Y=0.041+0.145*\text{platform scale}+0.122*\text{platform design}+0.122*\text{platform security}$.

5.3.2.2 Summary of the results of the proposed hypothesis (platform quality)

In this section, proposed hypotheses from vegetable retail platforms in terms of platform scale, platform design, and platform security are presented. The results of the proposed hypotheses are then summarized.

(1) Hypothesis 2

The quality of the vegetable retail platform in terms of platform size, platform design and platform security had a positive impact on the satisfaction of the vegetable retail platform.

More specifically :

H2a: The scale of the vegetable retail platform has a positive impact on customer satisfaction.

H2b: The design of the vegetable retail platform has a positive effect on customer satisfaction.

H2c: Security of vegetable retail platform has a positive effect on customer satisfaction.

(3) Summary of the results of the proposed hypothesis (platform of quality)

Table 9 Summary the results on proposed hypothesis (platform of quality)

	H2a. Platform scale	H2b. Platform design	H2c. Platform security
Customer satisfaction	S	S	S

(Note S: Supported; NS: Not supported)

According to Table 8 and Table 9, there is a positive effect between platform size ($\beta=0.145$, $p<0.05$) and customer satisfaction for vegetable retail platforms. Hypothesis H2a was supported. There is a positive effect between platform design ($\beta=0.122$, $p<0.05$) and customer satisfaction of vegetable retailing platform. Hypothesis H2b was supported. There is a positive effect between platform security ($\beta=0.122$, $p<0.05$) and customer satisfaction with the vegetable retailing platform. Hypothesis H2c was supported.

5.3.2.3 ANOVA test of quality factors of vegetable retailing platform

In this section, a one-way ANOVA will be used to examine whether the vegetable retailing platform quality factors (platform scale, platform design, and platform safety) have a positive effect on customer satisfaction.

Table 10 ANOVA test for vegetable retail platforms in terms of service

	Multiple R	R ²	Adjusted R ²	F-value	P-value
Platform scale					
Platform design	0.861	0.741	0.736	193.49	0.000
Platform security					

The variance test showed $F=193.49$, $p<0.05$, Multiple R of 0.861, R^2 of 0.741, and adjusted R^2 of 0.736 (see Table 10). qualitative aspects of Hema Fresh (platform scale, platform design, and platform security) were used as independent variables. Customer satisfaction was used as a statistically significant dependent variable in the regression model.

5.3.2.4 ANOVA results for vegetable retail platforms of quality

In this section, the results of the proposed one-way ANOVA will be used to analyze whether the aspects of vegetable retailing platform quality (platform scale, platform design and platform security) have a positive impact on customer satisfaction.

Table 11 ANOVA results for vegetable retail platform quality factors

	SS	df	MS	F-value	P-value
Regression analysis	121.998	3	16.908	139.493	0.000
Residual value	85.575	396	0.121		
Total	207.573	399			

Table 11 shows the results of the one-way ANOVA. As $\alpha=0.05$, $p\text{-value} < 0.05$. From these statistics, it is clear that the Hema Fresh Vegetables retail platform has a positive impact on customer satisfaction in terms of quality (platform scale, platform design and platform security).

5.4 Conclusion

According to the results of this study, product quality, logistics, cross-regional and price services have a positive effect on customer satisfaction in terms of services of vegetable retailing platforms; platform scale, platform design and platform security have a positive effect on customer satisfaction in terms of quality attitude of vegetable retailing platforms.

6. Discussion and Suggestions

6.1 Discussion

Table 12 Summary of Test Results for the Hypotheses

Hypothesis	Outcome
H1: Vegetable retail platform services have a positive effect on customer satisfaction.	Accepted
H1a: The product quality of vegetable retail platforms has a positive impact on customer satisfaction.	Accepted
H1b: Logistics of the vegetable retailing platform have a positive impact on customer satisfaction.	Accepted
H1c: The cross-regional service of the vegetable retailing platform has a positive impact on customer satisfaction.	Accepted
H1d: The service price of the vegetable retailing platform has a positive effect on customer satisfaction.	Accepted
H2: Vegetable retail platform quality has a positive impact on customer satisfaction.	Accepted
H2a: The scale of the vegetable retail platform has a positive impact on customer satisfaction.	Accepted
H2b: The design of the vegetable retail platform has a positive effect on customer satisfaction.	Accepted

Hypothesis	Outcome
H2c: Security of vegetable retail platform has a positive effect on customer satisfaction.	Accepted

6.1.1 Impact of vegetable retail platform services on customer satisfaction

6.1.1.1 Quality of products

Hypothesis H1a is that product quality of vegetable retail platforms has a positive impact on customer satisfaction. Based on the results of the study, it was found that platform product quality has a positive impact on customer satisfaction. Therefore, hypothesis H1a is supported. As mentioned by Wang and Yang (2020), platform product quality is positively related to customer satisfaction; the better the platform product quality, the higher the satisfaction level. As can be seen, the results of this study are consistent with the findings of previous scholars. Therefore, vegetable retail platforms should ensure that the vegetables received by customers are fresh and accurate as well as the parcels received are in good condition in order to satisfy customers.

6.1.1.2 Logistic

Hypothesis H1b is that logistics of vegetable retailing platform has a positive impact on customer satisfaction. Based on the results of the study, platform logistics was found to have a positive impact on customer satisfaction. Therefore, hypothesis H1b is supported. As mentioned by Collier and Bienstock (2015), platform logistics is positively related to customer satisfaction, and the faster the platform logistics, the higher the satisfaction. As can be seen, the results of this study are consistent with the findings of previous scholars. Therefore, vegetable retail platforms should ensure that they can deliver goods to customers the fastest, provide multiple logistics companies for customers to choose from, and that the platform can handle logistics problems in a timely manner so that customers can be satisfied with platform logistics.

6.1.1.3 Cross-region services

Hypothesis H1c is that cross-regional service of vegetable retailing platform has a positive impact on customer satisfaction. Based on the results of the study, it was found that platform cross-regional services have a positive impact on customer satisfaction. Therefore, hypothesis H1c is supported. As Feng and Wu (2013) mentioned, platform cross-regional is positively related to customer satisfaction, and the more attentive the platform cross-regional service, the higher the satisfaction. As can be seen, the results of this study are consistent with the findings of previous scholars. Therefore, vegetable retailing platforms should ensure that they can provide customers with vegetable varieties from multiple regions in China to ensure the diversity of customer choices, that the platforms can ensure the delivery of products to all regions of China that customers care about, and that the platforms can provide customers with 24-hour cross-regional uninterrupted service, therefore coming to improve timeliness. This will enable customers to be satisfied with the cross-regional service of the platform.

6.1.1.4 Price of services

Hypothesis H1d is that service price of vegetable retailing platform has a positive effect on customer satisfaction. Based on the results of the study, it was found that platform price service has a positive impact on customer satisfaction. Therefore, hypothesis H1d is supported. As Li and Hu (2015). mentioned, platform price is positively related to customer satisfaction, and the lower the platform price the higher the customer satisfaction. As can be seen, the results of this study are consistent with the findings of previous scholars. Therefore, the vegetable retail platform should ensure that it can provide customers with reasonable

vegetable prices to ensure repeat business as well as trust in the vegetable platform, the platform can ensure that the prices of its products are lower than other platforms, which will make customers more favorable to choose the platform, and the platform can give customers a longer discount time (more than two days) and therefore can make customers more willing to spend money in that vegetable retail platform. This will make customers satisfied with the platform price service.

Based on the results of the study, hypotheses H1a (product quality), H1b (logistics), H1c (cross-regional), and H1d (price service) were supported. Therefore, product quality, logistics, cross-regional and price services have a positive impact on satisfaction.

6.1.2 Impact of platform quality on customer satisfaction

6.1.2.1 Platform scale

Hypothesis H2a is that scale of the vegetable retail platform has a positive impact on customer satisfaction. Based on the results of the study, platform size was found to have a positive impact on customer satisfaction. Therefore, hypothesis H2a is supported. As Han and Hong (2007) mentioned, platform size is positively related to customer satisfaction, and the larger the platform size, the higher the customer satisfaction. As can be seen, the results of this study are consistent with the findings of previous scholars. Therefore, the vegetable retail platform should have high capital and therefore be able to win customers' trust, the vegetable retail platform should have multiple sellers to provide customers with more choices of vegetables, and the platform has a good reputation among the customer base, which can make customers more comfortable to spend money on the platform. This will make the customers satisfied with the scale of the platform.

6.1.2.2 Platform design

Hypothesis H2b is that design of the vegetable retail platform has a positive effect on customer satisfaction. Based on the results of the study, the platform design was found to have a positive impact on customer satisfaction. Therefore, hypothesis H2b is supported. As mentioned by Zhang (2019), platform design is positively related to customer satisfaction, and the clearer the platform design, the higher the customer satisfaction. As can be seen, the results of this study are consistent with the findings of previous scholars. Therefore, vegetable retailing platforms should have a clear menu of platform services and therefore enable customers to complete their shopping quickly. The design of the vegetable retail platform can make customers feel fresh, which can stimulate their desire to buy. The page layout of the platform is important for customers to be able to make them know clearly the menu section they want when they enter that vegetable retail platform. This will make the customer satisfied with the design of the platform.

6.1.2.3 Platform security

Hypothesis H2c is that security of vegetable retail platform has a positive effect on customer satisfaction. Based on the results of the study, platform security was found to have a positive impact on customer satisfaction. Therefore, hypothesis H2c was supported. As mentioned by Liao (2016), platform security is positively related to customer satisfaction, and the higher the platform security technology, the higher the customer satisfaction. As can be seen, the results of this study are consistent with the findings of previous scholars. Therefore, a vegetable retail platform should have a platform security policy (encryption, security standards, etc.) that can protect customers' personal information and therefore enable customers to use the vegetable retail platform with confidence. The vegetable retail platform should have a technology that protects the security of the customer's account so that the customer can feel safe when spending money. The platform should ensure that each function

works properly to enhance the customer's experience. This will make customers feel satisfied with the security of the platform.

Based on the results of the study, hypotheses H2a (platform scale), H2b (platform design), and H3c (platform security) were supported. Therefore, platform size, platform design, and platform security have a positive impact on satisfaction.

6.2 Suggestions

6.2.1 Suggestion for practitioners

It is necessary for all vegetable retail platforms in China to achieve high quality and efficiency in terms of product quality, logistics, cross-regional services and price services to ensure customer satisfaction. Further is the platform quality aspect, the platform should maintain sufficient capital cash flow, the platform has enough sellers to give customers more choices. In addition, a more important point is that the platform should maintain a good reputation among the customer base and improve customer trust in the vegetable retail platform. Vegetable retail platform practitioners need to listen to customer feedback and focus on personalized customer service and experience to keep customers satisfied.

6.2.2 Suggestion for further research

This study focuses only on the impact of vegetable retail platform services and the quality of the platform on customer satisfaction. This study collected information from some customers of major and famous vegetable retail platforms in China. Therefore, if someone needs to explore this area, it is recommended to collect data from customers of different vegetable platforms. In addition, it is recommended that each factor be studied in detail in future studies. For example, product quality, logistics, cross-regional, price, platform size, design, safety, etc. to focus on customer expectations.

7. Conclusions

7.1 In terms of platform services for vegetable retail platform

Product quality has a favorable impact on client happiness when it comes to vegetable retail platform services. Customer satisfaction improves as a result of logistics. Customer satisfaction is improved by cross-regional collaboration. Customer satisfaction is positively influenced by price service.

7.2 In terms of platform quality for vegetable retail platform

Platform size has a substantial positive impact on customer satisfaction in terms of platform quality. The way a platform is designed has a big impact on customers. The security of the platform has a huge positive impact on customers.

8. References (only used in the article)

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