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Research on influencing factors of customer satisfaction of e-commerce of characteristic agricultural products

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Abstract

Taking Yantai Cherry as an example, this paper studies the influencing factors of customer satisfaction in online shopping of characteristic agricultural products, and analyzes five influencing factors: pre-purchase expectation, product quality, brand image, e-commerce platform and logistics distribution, and designs a scale, puts forward assumptions and verifies them. The results show that pre-purchase expectation has no significant negative influence on customer satisfaction, product quality, brand image, e-commerce platform and logistics distribution have significant positive effects on customer satisfaction. Finally, based on the research conclusions, this paper puts forward some countermeasures and suggestions on improving customer satisfaction of characteristic agricultural products e-commerce from four aspects, which is of certain significance for increasing sales of specialty agricultural products and promoting the development of agricultural e-commerce.

Keywords: E-commerce; characteristic agricultural products; consumer satisfaction; structural equation modeling; influencing factors

1. Introduction

In recent years, online shopping has gradually become an important way of consumption. According to the 47th Statistical Report on Internet Development of China released by China Internet Information Center, as of December 2020, the number of online shopping users in China has reached 782 million, accounting for 79.1% of the total netizens, and online shopping has become a new growth point of economic development. Characteristic agricultural products refer to agricultural products with obvious local characteristics according to the local ecological environment. With the support of China's national policies, many e-commerce companies gradually pay more attention to e-commerce of specialty agricultural products. For example, e-commerce giants such as Alibaba and JD.COM take specialty agricultural products as their important selling points. Online shoppers have

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great enthusiasm and demand for agricultural products. However, due to the uncertainty of online shopping in quality, logistics and platform services, the risks of consumers buying characteristic agricultural products online increase, and they fail to meet consumption expectations, thus reducing consumer satisfaction, which ultimately has an adverse impact on the development of agricultural products e-commerce market. E-commerce of characteristic agricultural products has both opportunities and challenges. In order to improve competitiveness, e-commerce of characteristic agricultural products should always pay attention to consumers satisfaction and consider improvement measures.

Since Cardozo (1965) expounded the concept of customer satisfaction, many scholars began to pay attention to customer satisfaction and enriched and expanded its connotation [1]. Since 1980s, China has established the customer-oriented marketing concept and attached importance to customer satisfaction. In 1999, Chinese scholars first put forward the research requirements on satisfaction evaluation methods [2]. In recent years, domestic scholars have studied the influencing factors of customer satisfaction from different aspects, such as the operation quality, relationship quality and cost quality of third-party logistics service quality, which can have a positive impact on customer satisfaction [3].

The development of e-commerce platform promotes the sales of characteristic agricultural products, and many scholars begin to study characteristic agricultural products under the background of e-commerce. Though the research on satisfaction of online shopping agricultural products is increasing, the research on customer satisfaction of online shopping of characteristic agricultural products is relatively lacking and most studies do not consider the particularity of characteristic agricultural products [4-10]. Therefore, this paper combines the research result of existing literature, establishes a satisfaction model on the basis of relevant theories, and takes Yantai's characteristic agricultural product, Yantai Cherry, as an example, to make an in-depth study of influencing factors of customer satisfaction from five aspects: pre-purchase expectation, product quality, brand image, e-commerce platform and logistics distribution, the purpose of which is to improve the customer satisfaction of characteristic agricultural products under e-commerce environment.

2. Research design

2.1. Theoretical basis and research assumptions

The customer satisfaction model of this paper is based on expectation confirmation theory, service quality theory and perceived value theory. Expectation confirmation theory judges whether customers are satisfied by comparing their pre-purchase expectations and post-purchase values. The pre-purchase expectation is the expectation of customers for the formation of Yantai Cherry before online shopping, the received cherry quality and logistics efficiency can help customers evaluate the post-purchase value and compare it with the pre-purchase expectation, so as to judge whether the expectation can be confirmed. According to the service quality theory, there is a great difference between the service quality under the background of e-commerce and the service quality perception under the traditional consumption mode, because customers cannot directly contact with businesses and products. the perception of service quality needs medium, so customers need to communicate with sellers and complete consumption through e-commerce platform, and products need to be transferred from sellers to customers through logistics distribution. In this process, customers will receive e-commerce platform services and logistics distribution services, and the service quality customers feel will affect their satisfaction. Perceived value is the trade-off or comparison between the benefits gained and the costs paid by customers. Product quality can reflect the benefits brought by the product itself to customers, while brand image will enable customers to obtain additional benefits of products. For online shoppers, e-commerce platform and logistics distribution are indispensable in shopping, which not only involve the benefits gained by customers, but also include the costs that customers may pay, such as time cost and energy cost. When customers buy products online, they usually

compare benefits and costs to judge the perceived value, while the perceived value of customers will affect their satisfaction.

Based on the above theories, this paper puts forward the following assumptions:

H1: Pre-purchase expectation has a significant negative impact on customer satisfaction.

H2: Product quality has a significant positive impact on customer satisfaction.

H3: Brand image has a significant positive impact on customer satisfaction.

H4: E-commerce platform has a significant positive impact on customer satisfaction.

H5: Logistics distribution has a significant positive impact on customer satisfaction.

2.2. Scale design

In this paper, we use the previous research results for reference and combine with the characteristics of characteristic agricultural products [5-10], using Likert's five-point method to design measurement items. After analyzing the reliability and validity of the questionnaire through pre-investigation, the items are further improved and revised, and the final questionnaire is formed according to the above process, as shown in Table 1.

Table 1. Scale design

Latent variable	Notation	Measurement item
Pre-purchase expectation (A)	A1	Before online shopping, I have expectations for the freshness of Yantai Cherry
	A2	Before online shopping, I have expectations for the taste of Yantai Cherry
	A3	Before online shopping, I have expectations for the packaging safety of Yantai Cherry
	A4	Before online shopping, I have expectations for customer service and logistics quality of Yantai Cherry
Product quality (B)	B1	Yantai Cherry purchased online is fresh and tastes good
	B2	Yantai Cherry purchased online is reliable in quality and safe to eat
	B3	Yantai Cherry purchased online is well packaged
	B4	Yantai Cherry purchased online are not missing.
	B5	Yantai Cherry purchased online is consistent with the advertising of the merchants
Brand image (C)	C1	Online shopping of Yantai Cherry is affected by its popularity
	C2	Online shopping of Yantai Cherry is influenced by its propaganda
	C3	Online shopping of Yantai Cherry is influenced by its logo specification (origin, registered trademark)
E-commerce platform (D)	D1	The e-commerce platform has beautiful web design and clear functions
	D2	The e-commerce platform is simple to operate and convenient for shopping
	D3	The e-commerce platform can provide good after-sales service
	D4	The e-commerce platform can provide safe and convenient payment system
Logistics distribution (H)	H1	The speed of logistics distribution is fast
	H2	The speed of logistics distribution is low
	H3	Logistics distribution information can be queried in time
	H4	The products are not damaged or damaged
	M1	I am satisfied with the overall purchase of Yantai Cherry

Customer satisfaction (M)	M2	I think the Yantai Cherry purchased online is in line with expectations
	M3	I will choose Yantai Cherry online in the future
	M4	I will recommend Yantai Cherry online shopping to others

2.3. Survey design

Questionnaire survey was conducted online and offline, and about 90% of the questionnaires were obtained through online research. A total of 396 questionnaires were distributed in this survey, of which 360 were valid, with an effective recovery rate of 90%.

3. Empirical analysis

3.1. Reliability analysis and validity analysis

In this paper, Cronbach's Alpha coefficient method is used for reliability analysis. It can be seen from Table 2 that the reliability of the whole questionnaire is 0.935, and the reliability coefficient of each potential variable is greater than 0.7, which shows that the stability and internal consistency of the variables are good.

Table 2. Summary of reliability analysis

Latent variable	Number of effective samples	Number of measurement indexes	Cronbach's Alpha
Overall questionnaire	360	23	0.935
Pre-purchase expectation	360	4	0.824
Quality of product	360	5	0.798
Brand image	360	2	0747
E-commerce platform	360	4	0.784
Logistics distribution	360	4	0.803
Customer satisfaction	360	4	0.816

In order to test the extent to which the questionnaire truly reflects customer satisfaction and its influencing factors, this paper makes a validity analysis. Table 3 shows that KMO value is 0.919, and the significance probability in Barlett sphericity test is 0.000, less than 0.01, which meets the requirements of factor analysis. After that, exploratory factor analysis was carried out, and the results are shown in Table 4. The load coefficients of all factors are greater than 0.5. Therefore, the items of the scale are well designed and meet the requirements of our research.

Table 3. Results of KMO and Barlett sphericity test

Kaiser-Meyer-Olkin measure of sampling sufficiency		0.919
Barlett sphericity test	Approximate chi-square value	3136.303
	freedom	171
	significance level	.000

Table 4. Results of factor analysis of all samples

Latent variable	Measurement item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Product quality	B5	.773				
	B4	.742				
	B2	.683				
	B3	.633				
	B1	.568				
Pre-purchase expectation	A3		.786			
	A1		.743			
	A2		.718			
	A4		.674			
Logistics distribution	H1			.823		
	H2			.750		
	H4			.594		
	H3			.590		
E-commerce platform	D1				.717	
	D2				.694	
	D4				.630	
	D3				.557	
Brand image	C2					.770
	C1					.765

3.2. Structural equation model analysis

Based on the relevant academic research results at home and abroad, this study uses Amos24.0 as a model analysis tool to construct a structural equation model including six potential variables: pre-purchase expectation, product quality, brand image, e-commerce platform, logistics distribution and customer satisfaction.

In this study, GLS is used to estimate and test the overall fitness index of the hypothetical model. From the test results in Table 5, it can be seen that each fitness index is within the acceptable range. The results of indexes are good except that the values of AGFI and CFI are slightly lower than 0.9. Therefore, after comprehensive judgment, it can be considered that the fitting degree of the whole model is better, passing the verification.

Table 5. Results of fitness test of SEM overall model

Adaptability index	Absolute fitting index					Relative fitting index		
	$\chi 2/df$	GFI	AGFI	RMR	RMSEA	NFI	TLI	CFI
Value of this model	1.785	0.907	0.881	0.033	0.047	0.918	0.934	0.889

Table 6 shows the results of path coefficient test of structural equation model, from which it can be seen that the influence of pre-purchase expectation on customer satisfaction has not reached a significant level. The

absolute value of C.R. of the other four influencing factors is greater than 2.58, and the P value is less than 0.01. It is considered that the path coefficient is obviously not 0 at 99% confidence level, and the path coefficient is positive, indicating that it has a significant positive impact on customer satisfaction.

Table 6. Results of path coefficient estimation and hypothesis test

Path	Standardized path coefficient	C.R.	P	Hypothesis verification
Pre-purchase expectation-Customer satisfaction	-.104	-.171	.169	H1 is not valid
Product quality-Customer Satisfaction	0.361	4.198	***	H2 is established
Brand image-Customer Satisfaction	0.252	3.374	***	H3 is established
E-commerce platform-Customer satisfaction	0.383	4.375	***	H4 is established
Logistics and distribution-Customer Satisfaction	0.334	3.923	***	H5 is established

Note: *** P<0.01, ** P<0.05, * P<0.1

Assuming H1 is not true, the survey results show that customers have strong pre-purchase expectations for Yantai Cherry online shopping, but the hypothesis test results show that the customer satisfaction of Yantai Cherry online shopping is not significantly negatively affected by pre-purchase expectations.

Assuming H2 holds, the path coefficient of product quality to customer satisfaction is 0.361, and the statistical test reaches 1% significance level. Compared with other influencing factors, product quality has a greater impact, which indicates that customers have higher requirements for Yantai Cherry quality.

Assuming H3 holds, the path coefficient of brand image at 1% significant level is 0.252, which is the lowest among several factors. This shows that although brand image positively affects customer satisfaction, compared with other influencing factors, customers pay less attention to it.

Assuming H4 holds, the path coefficient of e-commerce platform to customer satisfaction is 0.383, and the statistical test reaches the significance level of 1%. It can be seen that when customers buy Yantai Cherry online, e-commerce platform has a significant positive impact on their satisfaction.

Assuming H5 holds, Yantai Cherry is a fresh agricultural product, and customers will have higher requirements for its freshness. Logistics distribution determines the freshness and taste of products to a certain extent. The quality of logistics distribution will not only affect the product quality, but also affect the customer's consumption experience.

From the above analysis, it can be seen that the pre-purchase expectation has no significant impact on customer satisfaction, while the other four influencing factors, product quality, brand image, e-commerce platform and logistics distribution, have significant positive impact on customer satisfaction, which accords with the theoretical hypothesis of our research.

4. Countermeasures and suggestions

4.1. Control the product quality

In order to encourage customers to buy products with confidence, on the one hand, e-commerce of characteristic agricultural products should strictly control the quality of products from the source, on the other hand, it should consciously cooperate with relevant departments to carry out quality inspection. One of the biggest differences between online shopping and traditional shopping is that consumers cannot directly observe and touch

products, so the description of specialty agricultural products by e-commerce should be detailed and true. In order to reduce the gap between pre-purchase expectation and post-purchase feeling, and improve customer satisfaction.

4.2. Promote the brand image

E-commerce of featured agricultural products can not only be promoted through traditional media and emerging social media platforms, but also by seeking help form government departments and other authoritative brand information release channels, so as to enhance the influence and credibility of brands.

4.3. Optimize the e-commerce platform

Internet sellers need to ensure that the design of web pages is humanized, the platform interface is simple to operate, and it is convenient for consumers to search and select products. E-commerce of characteristic agricultural products should form standardized and efficient customer service system, establish perfect after-sales management mechanism and provide safe, convenient and diversified payment channels.

4.4. Improve the logistics distribution service

E-commerce of characteristic agricultural products should process orders and deliver them in time to provide consumers with timely and accurate logistics information; Strictly treat the outer packaging of products and try to ensure the integrity of products during transportation; For products with special temperature requirements, a complete cold chain transportation system is needed to ensure the quality of products.

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