

Research on the Influencing Factors of Customer Satisfaction in Cross-border E-commerce

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Abstract: *With the rapid increase in international trade, research on the factors influencing customer satisfaction in cross-border e-commerce is essential to improve the online shopping experience. This article presents a literature review on cross-border e-commerce customer satisfaction and uses the Customer Journey Map to analyse the entire purchase process of cross-border businesses. It then puts forward hypotheses and creates an empirical model of customer satisfaction in cross-border e-commerce based on these findings. Next, data is collected through a questionnaire survey of 327 overseas consumers, and SPSS is used to analyse the data. The study concludes that five factors affect customer satisfaction in cross-border e-commerce: the reputation of cross-border platforms, services, cross-border payment convenience and safety, logistics, and perceived value.*

Keywords: *Cross-border e-commerce, Customer satisfaction, Influencing factors*

1. Introduction

In recent years, globalization has gradually matured, economic and trade exchanges between countries have become more frequent, and customers are increasingly purchasing goods across borders. According to research, global cross-border e-commerce transactions are expected to grow from 400 billion USD in 2016 to 1.25 trillion USD in 2021. By 2022, business-to-customer (B2C) cross-border online sales are expected to account for 22% of total e-commerce worldwide ^[1]. The rapid development of cross-border e-commerce has played a significant role in promoting economic integration and trade globalization. The development of cross-border e-commerce has evolved from the 1.0 era of business development through exhibition channels, to the 2.0 era of Internet B2B (business-to-business) platform interactions, followed by the 3.0 era of digital marketing channels, and has now reached the era of Foreign Trade 4.0, driven by big data and cloud computing. The rapid growth of cross-border e-commerce has significantly contributed to economic integration and the globalization of trade. On the one hand, more and more local enterprises are breaking through national barriers and expanding overseas, helping companies earn more profitable revenue; on the other hand, borderless business allows consumers to select cost-effective and high-quality products via international shopping websites, without the need to travel thousands of miles or rely on unreliable third-party agents.

2. Literature Review

There are two definitions of satisfaction. One refers to the actual psychological feeling of customers, and the other is defined as the difference between customers' actual feelings and expectations. Factors affecting customer satisfaction can be divided into psychological factors, such as expected expectations, customer needs, and fairness in the purchasing process, and actual factors, such as services, products, corporate image, and so on. Based on this, Sweden, the United States, Europe, and other countries have successively proposed models like SCSB, ASCI, and ESCI to summarize the factors affecting customer satisfaction. With the development of e-commerce, research on customer satisfaction has also become more comprehensive. Some influencing factors, such as web design, payment security, and product quality, have been extensively studied, while other less discussed factors include playfulness, enjoyment, entertainment, and interactivity. The literature on cross-border e-commerce is mainly based on the aforementioned research models.

When customers have a demand for products, they will choose different cross-border e-commerce platforms to make purchases. However, different e-commerce platforms have different reputations, which can influence customers' initial choices. For example, in 1998, Eugene found that word-of-mouth has a positive effect on customer satisfaction when studying word-of-mouth and customer relation ^[2].

However, dissatisfied customers are more likely to participate in platform evaluations. In 2019, Ganiesa proposed that corporate image has a positive and significant effect on customer satisfaction ^[3].

Services are often overlooked when customers shop online due to their unquantifiable and virtualized nature. This issue is even more complicated in cross-border e-commerce purchases. In 2006, Hibework found that the characteristics and behaviors of employees play an important role in online service ^[4]. In 2010, Tianxiang Sheng suggested that effectiveness, fulfillment, system accessibility, and privacy are the four dimensions of e-service quality. The results indicated that efficiency and fulfillment have positive effects on customer satisfaction, while fulfillment and privacy have positive effects on customer loyalty. However, the remaining factors had no significant effect on either customer satisfaction or customer loyalty ^[5]. In 2011, Adam Finn studied the non-linear positive relationship between e-services and satisfaction ^[6]. In 2012, Farnaz indicated that services, fulfillment, privacy, site aesthetics, responsiveness, and ease of use are the main components of e-service quality in Iran's internet banking. A significant positive relationship exists between e-SQ and e-CSI in internet banking ^[7]. In 2019, Paulo Rita showed that three dimensions of e-service quality, namely website design, privacy, and fulfillment, affect overall e-service quality ^[8].

When customers select products and are ready to pay, the convenience and security of payment are very important. In 2015, Roozbahani concluded that there is a positive relationship between e-payment tools and customer satisfaction ^[9]. In 2017, Enock James stated that the free services of online payment and the friendliness of web pages would increase user satisfaction ^[10]. In 2018, Md. Shamim Hossain showed that payments have an enormous impact on customer satisfaction and purchase intention ^[11]. In 2019, Wu Junyi studied the system efficiency, availability, responsiveness, liaison, and payment privacy of payment methods, finding that they are positively correlated with customer satisfaction ^[12]. In 2021, Sunny Sun showed that in the hospitality industry, mobile payment-related usability on customer satisfaction is transmitted through mobile payment-related attitude, subjective norms, and perceived behavioral control ^[13].

Logistics is an important component of cross-border e-commerce because it spans several countries to deliver products to customers. In 2014, Shah indicated that flexible logistics competencies, as well as the capabilities of the firm, are important to generate customer satisfaction ^[14]. In 2019, Angeline proposed that logistics service quality consists of five dimensions: information quality, ordering procedure, timeliness, order status, and order discrepancies handling ^[15]. In 2019, Lin Xiaofang proposed that customers' evaluation of products or services in the later stage will be affected by the quality of logistics services. Timeliness, reliability, safety, and perfect logistics services will optimize the customer shopping experience and enhance customer satisfaction ^[16]. In 2020, Hasan Uvet indicated that there are significant relationships between timeliness, order condition, personnel contact quality, operational information sharing, and the perception of customer satisfaction in logistics services ^[17]. In 2021, Yugang He believed that, in the long term, international logistics has a positive effect on cross-border e-commerce trade, while in the short term, the effect is the opposite ^[18].

Perceived value is the overall evaluation of the utility of a product or service after weighing the perceived benefits and the cost of acquiring it. In the early theories, scholars' research on perceived value was generally in terms of quality and value dimensions. Later, scholars divided these into three dimensions: functional value, emotional value, and social value. Most scholars agree that perceived quality has a positive effect on customer satisfaction. For example, in 2005, Rodoul concluded that perceived product quality has a direct positive effect on customer satisfaction when studying the purchase intentions model ^[19]. However, Cronin and Taylor (1994) indicated that perceived quality would not affect customers' purchase intentions when testing the SERVQUAL model ^[20].

3. Model Construction and Research Assumptions

Traditional customer satisfaction research is often limited to a single channel or platform. In contrast, the Customer Journey Map can analyze all touchpoints of a customer's buying process. Customer journey map tracks the sequence of activities performed by customer groups and the effective transitions of customers from one touchpoint to another. This approach is particularly useful for understanding how customers engage with omnichannel strategies, the quality of their experience at each stage of the buying process, and their overall satisfaction with the process. Typically, the customer journey is divided into four stages: Awareness, Interest, Action, and Advocacy. The corresponding stages and touchpoints, along with the factors influencing customer satisfaction, are explained as follows:

(1) Awareness: This stage corresponds to the motivation of customers in cross-border purchases. At

this stage, customers begin to understand why they choose to buy on cross-border platforms rather than domestic ones. They will consider well-known and trustworthy platforms. The factor that affects customer satisfaction at this stage is the website's reputation.

(2)Interest: This stage corresponds to customers searching for and browsing websites. When customers view products on the platform, they will consult customer service for detailed information about the products. Therefore, the attitude and behavior of customer service will affect customer satisfaction.

(3)Action: In this stage, two factors influence customer satisfaction: payment and logistics. Specifically, payment includes the convenience and security of cross-border payment, while logistics includes transportation cost, speed, and quality.

(4)Advocacy: This stage refers to customer behaviors after a purchase, corresponding to perceived value in cross-border e-commerce. Perceived value is very important due to the long return and refund cycles in cross-border purchases. It refers to whether the product quality and packaging integrity are consistent with online descriptions.

Table 1: Customer Journey Map

	AWARENESS	INTEREST	ACTION		ADVOCACY
	Motivation	Browses sites	Payment	Transportation	Evaluates products
Touchpoints	the products are not available or more expensive in home country	Customer services attitude	Jump directly to the payment page?	Logistics speed and cost	Is the product quality consistent with the product information?
	Impression of famous platform	Customer service response speed	the platform can ensure the security of customer e-wallets	Transportation cost and quality	It is worth the time and effort.
Factors influence CS	Reputation	Services	Financial Convenience and Security	Logistics	Perceived Value
Customer Satisfaction					

3.1. Variable Description and Assumptions

Based on the theoretical reviewer and customer journey mapping analysis, dependent variable is customer satisfaction, and independent variables are corporate reputation, service, perceived value, payment, logistics. The assumptions are as following:

Table 2: Assumptions

H1: The cross-border e-commerce platforms reputation has a positive effect on customer satisfaction.
H2: The cross-border e-commerce platforms service has a positive effect on customer satisfaction.
H3: Customer' perceived value in cross-border purchases has a positive effect on customer satisfaction.
H4: Cross-border payment has a positive effect on customer satisfaction.
H5: Cross-border logistics has a positive effect on customer satisfaction.

4. Data Analysis and Hypothesis Testing

In recent years, globalization has gradually matured, economic and trade exchanges between countries have become more frequent, and customers are increasingly purchasing goods across borders. According to research, global cross-border e-commerce transactions are expected to grow from 400 billion USD in 2016 to 1.25 trillion USD in 2021. By 2022, business-to-customer (B2C) cross-border online sales are expected to account for 22% of total e-commerce worldwide ^[1]. The rapid development of cross-border e-commerce has played a significant role in promoting economic integration and trade globalization. The development of cross-border e-commerce has evolved from the 1.0 era of business development through exhibition channels, to the 2.0 era of Internet B2B (business-to-business) platform interactions, followed by the 3.0 era of digital marketing channels, and has now reached the era of Foreign Trade 4.0, driven by big data and cloud computing. The rapid growth of cross-border e-commerce has

significantly contributed to economic integration and the globalization of trade. On the one hand, more and more local enterprises are breaking through national barriers and expanding overseas, helping companies earn more profitable revenue; on the other hand, borderless business allows consumers to select cost-effective and high-quality products via international shopping websites, without the need to travel thousands of miles or rely on unreliable third-party agents.

4.1. Sample Demographics

Descriptive statistics are mainly conducted on the demographic characteristics and customer decisions in cross-border online shopping. Cross-border e-commerce customer groups are characterized by youth, high education, high income, and prudence. The research results show that more than 90% of cross-border customers are under the age of 40, nearly 80% of customers have a bachelor's degree or above, and more than half of them have a monthly income above the average level. The purchase value of goods below 3,000 yuan accounts for 81.7%. Overall, the questionnaire on the influencing factors of customers' purchase intentions on cross-border e-commerce platforms is representative.

4.2. Reliability Analysis

Reliability analysis is primarily used to assess the internal consistency of each variable scale. In this paper, Cronbach's alpha coefficient is employed to measure the internal consistency of the reliability variables. Generally, a Cronbach's alpha coefficient above 0.9 indicates excellent reliability, a value between 0.8 and 0.9 suggests good reliability, between 0.7 and 0.8 indicates acceptable reliability, between 0.6 and 0.7 suggests average reliability, and between 0.5 and 0.6 indicates less-than-ideal reliability. If the Cronbach's alpha is below 0.5, it is necessary to reconsider the questionnaire design. Further analysis should be performed on the item-total statistics table to identify items that contribute to the decline in overall reliability. If the reliability is lower than 0.3 or if the "alpha value after item deletion" is significantly higher than the original alpha, the item should be considered for removal.

Table 3: Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.939	0.94	19

The reliability analysis for each variable subscale is shown in the table below. This paper also analyzes the "Cronbach's Alpha value after item deletion" for each item. This value is used to assess the change in the alpha value when a particular item is removed. If deleting an item result in a lower alpha value, it indicates that the item contributes to the variable's reliability and should be retained. Based on the reliability analysis results, the Cronbach's alpha value for all variables is above 0.9, and the alpha value after deleting any item is lower than the original alpha for each variable. Therefore, the scale reliability for all variables is excellent, and all items are valid and should be retained.

Table 4: Reliability Analysis

Question number	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q11	72.37	138.553	0.591	0.477	0.937
Q12	72.2294	137.668	0.616	0.587	0.937
Q13	72.055	137.494	0.672	0.649	0.936
Q14	72.1101	136.111	0.681	0.673	0.935
Q15	72.2691	137.093	0.624	0.615	0.936
Q16	72.184	135.813	0.698	0.641	0.935
Q17	72.128	136.750	0.656	0.599	0.936
Q18	71.889	136.172	0.700	0.669	0.935
Q19	72.254	136.472	0.631	0.598	0.936
Q20	71.997	136.696	0.695	0.650	0.935
Q21	72.202	135.609	0.718	0.622	0.935
Q22	72.275	136.979	0.613	0.482	0.937
Q23	72.385	136.176	0.656	0.588	0.936
Q24	72.263	137.164	0.67	0.706	0.936
Q25	72.312	136.418	0.703	0.775	0.935
Q26	72.373	136.903	0.65	0.686	0.936
Q27	72.367	137.399	0.641	0.667	0.936
Q28	72.572	136.626	0.583	0.728	0.937
Q29	72.554	137.917	0.548	0.709	0.938

4.3. Validity Analysis

Validity analysis refers to the validity and correctness of the questionnaire, i.e., analyzing whether the design of the questionnaire questions is reasonable. KMO and Bartlett's test of sphericity are used to complete validity analysis. For the KMO test, a value of 0.9 is considered excellent for factor analysis; a value between 0.8 and 0.9 is very suitable; between 0.7 and 0.8 is suitable; between 0.6 and 0.7 is acceptable; between 0.5 and 0.6 is poor; and a value below 0.5 suggests that factor analysis should not be conducted. A passing KMO test indicates that there is a correlation among the item variables, which meets the requirements for factor analysis. For Bartlett's test, if the significance level is less than 0.05 or 0.01, the null hypothesis is rejected, suggesting that factor analysis can be performed. If the null hypothesis is not rejected, it implies that these variables may provide some information independently and are not suitable for factor analysis. The KMO value for the overall scale is 0.928, which is much larger than 0.7, and the significance of Bartlett's sphericity test is 0.000, which is less than 0.05. This indicates that the data from the questionnaire is valid. After passing the validity analysis, subsequent correlation analysis and regression analysis can be conducted.

Table 5: Validity Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.928
Bartlett's Test of Sphericity	Approx. Chi-Square	4490.44
	df	171
	Sig.	0

4.4. Correlation analysis

The Pearson correlation coefficient is used to measure the dependence between variables. According to the SPSS data analysis, it is found that the five factors—reputation, service, cross-border payment, logistics, and perceived value—are significantly related to satisfaction at a significance level of $p < 0.05$. The correlation coefficients between these five factors and customer satisfaction are 0.427, 0.393, 0.349, 0.413, and 0.719, respectively.

Table 6: Correlation Analysis

		Reputation	Service	Payments	Logistics	PV	Satisfaction
Satisfaction	Pearson Correlation	.427**	.393**	.349**	.413**	.719**	1
	Sig. (2-tailed)	0	0	0	0	0	
	N	327	327	327	327	327	327

** Correlation is significant at the 0.01 level (2-tailed).

4.5. Regression Analysis

R-squared (R^2) represents the goodness of fit, which is a measure of how well the estimated model fits the observations. The value of R^2 is closer to 1, the better the model fits the data. In this case, the adjusted R-squared is 0.524, indicating that the independent variables can explain 52.4% of the variation in the dependent variable.

Table 7: Table of R Square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.729a	0.531	0.524	0.59394	0.531	72.651	5	321	0	1.943

a Predictors: (Constant), Reputation, Service, Payments, Logistics, Perceived value

b Dependent Variable: Satisfaction

ANOVA represents the results of the analysis of variance, and the F-value is a general test of the entire regression equation. The F-value corresponds to $p < 0.05$, suggesting that the regression equation is statistically significant and can be considered useful.

Table 8: Table of R Square

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	128.143	5	25.629	72.651	.000b
Residual	113.237	321	0.353		
Total	241.38	326			

a Dependent Variable: Satisfaction

b Predictors: (Constant), Reputation, Service, Payments, Logistics, Perceived value

In conclusion, the reputation and perceived value of cross-border e-commerce platforms are statistically significant ($p < 0.05$), indicating that they have a greater impact on customer satisfaction. The other three factors—service, cross-border payment, and logistics—have a comparatively lesser influence. The regression model is as follows:

$$CS = 0.146 \cdot R + 0.695 \cdot P + 0.05 \cdot S + 0.023 \cdot L + 0.617 \quad (1)$$

4.6. Analysis of Variance

This chapter analyzes the differences in the impact of factors such as gender, age, education level, and monthly income on customer satisfaction. An independent sample t-test was performed on gender. As shown in the table above, the significance (sig) of gender on all factors is greater than 0.05, indicating that there is no significant difference in satisfaction levels between genders. A one-way analysis of variance was conducted for age and education level, which also showed no significant difference in satisfaction across different age groups or education levels.

5. Research Conclusions and Recommendations

5.1. Research Conclusions

This chapter analyzes the differences in the impact of factors such as gender, age, education level, and monthly income on customer satisfaction. An independent sample t-test was performed on gender. As shown in the table above, the significance (sig) of gender on all factors is greater than 0.05, indicating that there is no significant difference in satisfaction levels between genders. A one-way analysis of variance was conducted for age and education level, which also showed no significant difference in satisfaction across different age groups or education levels.

5.2. Recommendations

(1) Improve Brand Awareness: Cross-border e-commerce platforms or websites should enhance their brand reputation by promoting a positive company image through online or offline campaigns, strengthening brand development, and providing product quality guarantees.

(2) Enhance Service Quality: Platforms should improve services by understanding customer needs and pain points. This can be done by adding feedback options on the website, providing employee training, responding to customer inquiries promptly, and creating an FAQ page.

(3) Improve Payment Convenience: Cross-border platforms should streamline payment processes and collaborate with local payment providers. They should also prioritize e-wallet security by strengthening firewall technologies and establishing secure application protocols.

(4) Optimize Logistics Services: B2C e-commerce platforms should develop their own logistics systems and focus on personnel training to ensure timely and high-quality delivery services. Additionally, collaborating with third-party logistics companies that use convenience stores and chain operations can help achieve fast and cost-effective logistics solutions.

(5) Enhance Perceived Value: Customers not only consider the economic utility of products but also the overall shopping experience. To improve perceived value, platforms should offer a wider variety of products to meet customer needs and design attractive interfaces to enhance customer enjoyment.

5.3. Research Limitations and Future Prospects

While this research identifies several key factors affecting customer satisfaction in cross-border shopping, there may be additional factors that influence satisfaction, which were not addressed in this

study. Future research could explore these factors. Furthermore, the data for this study were primarily sourced from Chinese individuals with overseas experience. Given that cross-border e-commerce involves customers and platforms from different countries, future studies should include data from customers in Europe, the Americas, and other parts of Asia to provide more comprehensive results.

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