Exploring the Factors Influencing Purchase Intentions on Cross-Border E-Commerce Platforms

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ARTICLE INFO	ABSTRACT
Published Online: **27 March 2025** **Corresponding Author:** **I-Ching Chen**	With the globalization of the economy, the rapid development of cross-border e-commerce platforms has made the study of consumers' purchase intentions increasingly important. This research aims to explore the main factors influencing consumers' purchase intentions on B2C or B2B cross-border e-commerce platforms, including aspects such as websites, products, payment methods, and logistics. Understanding the impact of these factors on consumers' purchase intentions not only helps e-commerce platforms optimize user experience but also provides a basis for merchants to formulate effective marketing strategies, thereby promoting the sustainable development of cross-border e-commerce. This study employs the Analytic Hierarchy Process (AHP) and uses a questionnaire survey to identify the key factors influencing consumers' purchase intentions and their relative importance, revealing the weight relationships between these factors. The research finds that products and website services are the most important factors influencing consumers' purchase intentions, followed by payment methods and after-sales services. The results indicate that e-commerce platforms should focus on enhancing these various factors to effectively promote consumers' purchase decisions and thereby drive the development of cross-border e-commerce businesses.
KEYWORDS: Cross-border e-commerce; E-commerce platform; Purchase intention; Satisfaction; Analytic Hierarchy Process	

I. INTRODUCTION

A. Research Background and Motivation

With the acceleration of globalization and the rapid development of internet technology, cross-border e-commerce has become a new trend in international trade, attracting a large number of consumers. However, despite the increasing number of cross-border e-commerce platforms, consumers' purchase intentions are constrained by various factors, such as product prices, logistics services, and transaction security. Therefore, it is of great significance to deeply explore the factors influencing consumers' purchase intentions on cross-border e-commerce platforms to promote the healthy development of the industry.

B. Research Objective

This study employs the Analytic Hierarchy Process (AHP) to systematically identify and evaluate the various factors influencing purchase intentions, clarifying the relative importance of these factors to consumers' purchase intentions. The aim is to provide optimization suggestions for cross-border e-commerce platforms to enhance customer satisfaction and loyalty. It also offers theoretical support for

related enterprises to formulate effective marketing strategies. Through in-depth analysis, the research aims to contribute to the sustainable development of the cross-border e-commerce industry.

II. LITERATURE REVIEW

A. Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP) is a multi-criteria decision analysis tool proposed by American operations researcher Saaty in the mid-1970s. This method combines qualitative and quantitative analysis techniques and is widely used in various fields to help decision-makers effectively address and solve problems. Through this method, decision-makers can clearly assess the importance of different factors to make more scientific and rational decisions. The AHP evaluates decision criteria through pairwise comparisons and determines the priority of each criterion based on principles of reciprocity, homogeneity, dependence, and expectation. This means that when comparing criteria, decision-makers need to consider the

interrelationships and similarities between different criteria to reasonably allocate their importance.

B. Factors Influencing Purchase Intentions on Cross-Border E-commerce Platforms

In the context of the rapid development of cross-border e-commerce, consumers' purchase intentions are influenced by various factors. Through literature research, these influencing factors can be categorized into the following five major categories: website, product, finance, logistics, and after-sales service. Understanding and optimizing these five categories of factors is of significant importance for enhancing purchase intentions on cross-border e-commerce platforms.

Website: Lu, Zhao, and Wang (2010) pointed out that providing content in the local language is an important strategy to enhance consumer trust and purchase intentions. This localization strategy helps cross-border e-commerce platforms better attract and retain consumers. Flanagin et al. (2014) emphasized the core role of information accuracy and user-generated content in improving information credibility, influencing product quality perception, and purchase intentions. Bai, Law, and Wen (2007) showed that website quality is a key factor affecting customer satisfaction and purchase intentions, with information accuracy and reliability being important components. Lai and Chung (2007) noted that timely and relevant word-of-mouth information can enhance consumer trust, increase decision-making efficiency, and thus promote purchasing behavior. Hausman and Siekpe (2009) believed that factors such as visual appeal, user experience, brand consistency, and clarity of information presentation all affect consumer satisfaction and trust. Van der Heijden et al. (2003) studied the impact of website usability on online purchase intentions from a technology and trust perspective.

Products: Shareef et al. (2009) pointed out that products carry specific cultural meanings, and by understanding and integrating elements from different cultures, companies can design and promote more attractive products to meet the needs of global consumers. Chiu et al. (2012) found through empirical analysis that reasonable pricing significantly positively affects consumers' perception of utilitarian value, thereby promoting their intention to make repeat purchases. Gefen (2000) emphasized the critical role of familiarity and trust in promoting online transactions; using familiar language can improve user experience, reduce cognitive load, and enhance their purchase intentions. Van der Heijden et al. (2003) demonstrated that good technical support can enhance consumers' trust [8]. Corbitt et al. (2003) found that the level of trust is significantly positively correlated with purchase intentions, and transparency of product information is one of the key factors in building consumer trust. Pei et al. (2014) suggested that fair return policies significantly affect consumers' purchase intentions; optimizing return policies and improving transparency help

attract and retain customers. Hajli (2015) noted that in a social commerce environment, when a product is frequently mentioned or recommended on social platforms, other consumers perceive the product as popular, thereby enhancing their purchase intentions.

Payment Flow: Yoon (2002) found through the study of trust antecedents and consequences that diversified payment methods and transaction security can enhance consumers' trust in online shopping platforms, thus affecting their purchase decisions. Huang et al. (2007) indicated that different currencies and exchange rates in overseas transactions can influence consumers' trust and purchase decisions because they might need to consider changes in actual payment amounts. He and Mykytyn (2007) analyzed the decision factors for consumers when choosing online payment systems, emphasizing the core importance of security and convenience in the decision-making process. Additionally, technical support, customer service quality, and response speed play significant roles in consumers' decisions.

Logistics: Ramanathan (2010) indicated that good logistics performance, including order processing, delivery speed, and customer service, can improve customer satisfaction and loyalty. Young Kim and Kim (2004) found that consumers' perceptions of uncertainty and potential losses (such as quality, financial, and privacy risks) during the purchasing process have a significant negative impact on online purchase intentions. Singh et al. (2010) explored the development of global e-commerce and its impact on the market, emphasizing that effective management of logistics and supply chains is a key factor in ensuring timely delivery and customer satisfaction. Ding et al. (2017) stated that the complexity, costs, and regulatory differences of cross-border transportation are major challenges faced by cross-border e-commerce. Shareef et al. (2009) analyzed the challenges globalization brings to e-commerce, such as the complexity of laws and regulations and market access barriers. Mentzer et al. (2001) emphasized the importance of logistics service quality in market competition and suggested optimizing logistics services based on market segmentation to enhance customer satisfaction.

After-Sales Service: Weisberg et al. (2011) utilized the mediating roles of social presence and trust, finding that they are related to communication efficiency. Overcoming language barriers and improving communication effectiveness are crucial for enhancing consumer trust and purchase intentions. Pei et al. emphasized that fair and good return policies can effectively boost consumers' purchase intentions [13]. Yen and Lu (2008) explored various dimensions of e-service quality, such as responsiveness, reliability, and website design, all of which affect consumer satisfaction and loyalty. Lee and Lin (2005) argued that when choosing online retailers, consumers consider their after-sales service and dispute resolution capabilities, with a complete and fair dispute resolution mechanism being an

important component of e-service quality. Chu et al. (2005) found that in cross-border e-commerce shopping, consumers may face difficulties in legal enforcement and rights protection, making the improvement and coordination of cross-national consumer protection laws increasingly important.

III. RESEARCH METHODOLOGY AND RESEARCH DESIGN

A. Research Methodology

This study employs the Analytic Hierarchy Process (AHP) to construct a hierarchical model, conducting pairwise comparisons of different factors and performing consistency checks to calculate the relative weights of each factor, providing a basis for decision-making and evaluation. Additionally, the Delphi method was used, inviting 40 research subjects, including professionals, scholars, and industry practitioners in the field of cross-border e-commerce, to participate in multiple rounds of face-to-face interviews to gather their collective opinions. The collected data were organized into five main categories: website, product, payment flow, logistics, and after-sales service. A questionnaire survey was then conducted to obtain and evaluate the relative weights of these categories.

B. Research Design

Establishing the Hierarchical Structure Model: Based on the categorized factors, a hierarchical structure model is constructed, as shown in Figure 1.
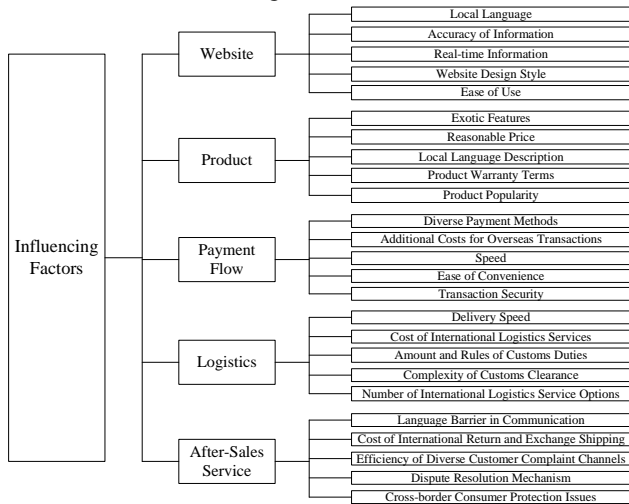
Figure 1. Hierarchical Structure Model Diagram

Establishing the Judgment Matrix: The Analytic Hierarchy Process (AHP) establishes the judgment matrix using the consistency matrix method. It does not compare all factors at once, but rather uses a relative scale for pairwise comparisons, reducing the difficulty of comparing factors of different natures. The following example illustrates the influencing factors of the website, as shown in Equation 1.

$$\begin{bmatrix} 1 & 1.3259 & 1.2488 & 2.0697 & 1.4913 \\ 0.7542 & 1 & 2.2709 & 2.7404 & 2.3451 \\ 0.8007 & 0.4404 & 1 & 2.1518 & 1.4996 \\ 0.4832 & 0.3649 & 0.4647 & 1 & 0.8685 \\ 0.6705 & 0.4264 & 0.6668 & 1.1513 & 1 \end{bmatrix} \rightarrow (1)$$

Hierarchical Single Sorting: Based on the judgment matrix, the relative importance ranking weights of the factors in the previous level can be calculated. This process is known as hierarchical single sorting. The eigenvector (weight) is calculated using the geometric mean, with the formula as follows:

$$w_i = (\prod_{j=1}^{n} a_{ij})^{\frac{1}{n}} \Big/ \sum_{i=1}^{n}(\prod_{j=1}^{n} a_{ij})^{\frac{1}{n}} \quad i,j=1,2,..,n \rightarrow (2)$$

Where w_i is the eigenvector (weight), a_{ij} is the judgment matrix.

Conducting Consistency Check: To ensure the scientific and rational judgment of the respondents, a consistency check of the calculation results is required. The Analytic Hierarchy Process (AHP) measures the consistency of the judgment matrix through the consistency ratio. It mainly relies on the Consistency Index (C.I) and Consistency Ratio (C.R). Saaty (1980) suggested that the Consistency Ratio (C.R) should be less than or equal to 0.1; only within this range is consistency considered acceptable. The formula for the Consistency Index is as follows:

$$C.I = \frac{\lambda_{max} - n}{n - 1} \rightarrow (3)$$

$$\lambda_{max} = \frac{1}{n}\left(\frac{w_1{'}}{w_1} + \frac{w_2{'}}{w_2} + \cdots + \frac{w_n{'}}{w_n}\right) \rightarrow (4)$$

Where λ_{max} is the maximum eigenvalue, n is the number of factors, $C.I$ is the Consistency Index, and w' is the maximum eigenvalue of each column. $w_1, w_2, \ldots, w_n$ are the eigenvectors. Generally, $C.I = 0$ indicates that the judgment matrix is perfectly consistent; conversely, the larger the $C.I$ value, the poorer the consistency. Finally, to account for random errors, the Consistency Ratio $C.R$ is introduced. If $C.R \leq 0.1$, it indicates that the consistency level is within an acceptable range. The formula is as follows:

$$C.R = \frac{C.I}{R.I} \rightarrow (5)$$

Where $R.I$ (Random Index) is the Random Consistency Index, as shown in Table I.

Table I. Random Consistency Index R.I Values

n	1	2	3	4	5	6	7	8	9
R.I	0.00	0.00	0.58	0.96	1.12	1.24	1.32	1.41	1.45

IV. DATA ANALYSIS

A. Sample Description

The online survey was conducted from May 1, 2024, to May 10, 2024, and a total of 200 questionnaires were collected.

Among them, 172 were valid and 28 were invalid. Of the participants, 63% were female and 37% were male. The majority of participants were aged between 21 and 30 years, and all had at least a high school education, with the largest proportion being undergraduates. To ensure the validity of the sample and the reliability of the data, questionnaires that were clearly not filled out seriously were excluded after collection. The criteria for excluding invalid questionnaires were as follows: questionnaires completed in less than the minimum required time, multiple submissions by the same respondent, incomplete questionnaires, and questionnaires with uniform answers.

B. Consistency Check Analysis

Saaty proposed the CR indicator to evaluate the consistency of the judgment matrix. Generally, the consistency ratio reflects whether the consistency of the judgment matrix is within an acceptable range; if it is not within this range, the judgment matrix needs to be re-established or invalid data needs to be excluded. The consistency ratio is calculated based on the research design steps and formulas. As shown in Table II, the CR value is less than 0.1, indicating that the error is within an acceptable range, and the model passes the consistency check.

Table II. Summary of Main Project Weights for Influencing Factor

Main Project.	C.I Value	R.I Value	C.R Value
Website	0.02333	1.12	0.02083
Product	0.00716	1.12	0.00640
Payment Flow	0.01646	1.12	0.01470
Logistics	0.01017	1.12	0.00908
After-Sales Service	0.06761	1.12	0.06037

Finally, the weight values for the sub-projects of the five main influencing factors were calculated, as shown in Table III.

Table III. Summary of Sub-Project Weights for Influencing Factors

Main Project	Sub-Project	Weight Value	Main Project	Sub-Project	Weight Value
Website	Local Language	0.2588	Product	Exotic Features	0.1603
Website	Accuracy of Information	0.3017	Product	Reasonable Price	0.2787
Website	Real-time Information	0.1916	Product	Local Language Description	0.1642
Website	Website Design Style	0.1101	Product	Product Warranty Terms	0.2593
Website	Ease of Use	0.1379	Product	Product Popularity	0.1375
Payment Flow	Diverse Payment Methods	0.2216	Logistics	Delivery Speed	0.2303
Payment Flow	Additional Costs for Overseas Transactions	0.1771	Logistics	Cost of International Logistics Services	0.2344
Payment Flow	Speed	0.1443	Logistics	Amount and Rules of Customs Duties	0.2305
Payment Flow	Ease of Convenience	0.1537	Logistics	Complexity of Customs Clearance	0.1676
Payment Flow	Transaction Security	0.3033	Logistics	Number of International Logistics Service Options	0.1373
After-Sales Service	Language Barrier in Communication	0.1820	After-Sales Service	Efficiency of Diverse Customer Complaint Channels	0.1910
After-Sales Service	Cost of International Return and Exchange Shipping	0.1778	After-Sales Service		
After-Sales Service	Dispute Resolution Mechanism	0.2205	After-Sales Service	Cross-border Consumer Protection Issues	0.2101

V. RESEARCH CONCLUSIONS AND RECOMMENDATIONS

A. Research Conclusions

This study uses the Analytic Hierarchy Process (AHP) to systematically analyze the five major factors influencing

consumers' purchasing intentions on cross-border e-commerce platforms. These factors include: website, product, payment, logistics, and after-sales service. Through the analysis of the weights of each factor, it is concluded that on the website, the accuracy of information and the use of the local language have higher weights; for the product, reasonable price and product warranty conditions have higher weights; in terms of payment, transaction security and the diversification of payment methods have higher weights; in logistics, the cost of international logistics services, customs duties and regulations, and delivery speed have higher weights; and in after-sales service, the dispute resolution mechanism and cross-border consumer protection issues have higher weights. Overall, the five factors with the highest weights are: transaction security, accuracy of information, reasonable price, product warranty conditions, and use of the local language.

B. Recommendations

Based on the conclusions of this study, recommendations are made regarding the main factors influencing consumers' purchasing intentions on cross-border e-commerce platforms. These recommendations are proposed from three perspectives: cross-border e-commerce platforms, merchants, and consumers, in order to help enhance the platform's competitiveness and consumer satisfaction.

Recommendations for Cross-Border E-Commerce Platforms: Given that transaction security has the highest weight, cross-border e-commerce platforms should prioritize investing in secure payment technologies, employing encryption measures to protect consumer information, and establishing comprehensive risk control mechanisms to monitor and prevent potential fraudulent activities, thereby enhancing consumer trust. Simultaneously, platforms need to establish stringent product information review mechanisms to ensure the accuracy of product descriptions, images, and related content, reducing issues caused by inaccurate information. Additionally, clearly display prices on product pages, including shipping fees and taxes, to avoid hidden charges. Provide multilingual website versions, especially supporting the local languages of major markets, to enhance the convenience of shopping for consumers.

Recommendations for Merchants: Merchants using cross-border e-commerce platforms should provide detailed product warranty policies and prominently display them on the product pages to increase consumer confidence in their purchases. At the same time, they should establish a good after-sales service system to promptly address consumer issues and complaints. Reasonable prices should be set through market research, and promotional activities should be launched in a timely manner, maintaining price transparency to reduce consumer concerns. Additionally, ensure the completeness and accuracy of product information, including dimensions, materials, usage instructions, etc., and provide high-definition images and videos to enhance consumer confidence in their purchases. Collaborate with reliable logistics companies to ensure timely delivery and provide logistics tracking services to improve the consumer shopping experience.

Recommendations for Consumers: When choosing a cross-border e-commerce platform, consumers should pay attention to the security of the platform and prioritize reputable websites, avoiding transactions on unknown platforms. Before making a purchase, they should carefully read the product descriptions, reviews, and after-sales service policies to minimize disputes caused by incorrect information. Additionally, they should choose secure payment methods and avoid using unsecured public networks for payments to protect their personal financial information. After shopping, providing timely feedback on product quality and service experience can help merchants improve and provide reference for other consumers.

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