Original Research Article

Research on the evaluation system for E-commerce return logistics service quality: A case study of the Taobao platform

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Abstract: In the digital economy, high return rates for online shopping have made return logistics a critical factor in E-commerce development, yet existing evaluation systems struggle to accommodate the unique characteristics of reverse logistics for returns. Taking Taobao as the research subject, this paper constructs a four-dimensional evaluation system for return logistics service quality, encompassing return policies, communication quality, process quality, and consumer costs. Factor analysis was employed to determine the weighting of indicators. Findings indicate that return policies and communication quality serve as core primary indicators. Among secondary indicators, timely customer service response and reasonable return reason stipulations carry higher weights, while consumers exhibit lower sensitivity to process execution and cost allocation details. These results provide insights for E-commerce platforms to optimize return logistics services and enhance consumer trust and loyalty.
Keywords: E-commerce; return logistics; service quality; evaluation system

1. Introduction

The deep integration of the digital economy and E-commerce has made online shopping the dominant consumption method. High transaction volumes coupled with consistently high return rates have elevated return services to a critical factor influencing consumer repurchase decisions, while return logistics has become a key driver for enterprises to build competitive advantages and enhance customer value[1]. Service quality theory indicates that consumers' quality judgments stem from their perceived evaluations of both the service process and outcomes[2]. In E-commerce scenarios, where physical contact is absent, service quality relies more heavily on system support, information exchange, and efficient process design[3]. Traditional Logistics Service Quality (LSQ) research focuses on the timeliness and integrity of forward logistics[4], yet overlooks the high complexity and strong technical dependency of reverse logistics service experiences in returns.

Current consumer returns still face pain points such as difficulty in scheduling appointments and delayed information feedback. Relevant studies indicate that reliability, convenience, and responsiveness are core dimensions of perceived return service quality[5]. However, existing evaluation frameworks fail to account for the unique "reverse flow" nature of return logistics, making it difficult to accurately reflect consumers' genuine perceived needs. Therefore, this paper integrates theories from electronic service quality and logistics service quality to construct an evaluation system for E-commerce return logistics service quality. It identifies key consumer perception indicators, providing theoretical foundations and practical guidance for E-commerce platforms to optimize reverse logistics management and enhance consumer trust and loyalty.

2. Evaluation indicator system construction

This study revises existing relevant research scales to design evaluation indicators matching the E-commerce return scenario, which has a solid theoretical foundation and good practical operability. Details are shown in

Table 1.

Table 1. Evaluation indicators for return logistics service quality.

Primary Indicators	Secondary Indicators
Return Policy	Reasonableness of Restrictions on Returned Product Categories (RP1)
	Reasonableness of Specified Return Reasons (RP2)
	RP3 Reasonableness of Return Timeframe Requirements
	Diversity and Convenience of Return Methods (RP4)
Communication Quality	Customer Service Response Timeliness (CQ1)
	Effectiveness of Solutions (CQ2)
	Customer Service Attitude (CQ3)
	Consistency of Service Attitude (CQ4)
Process Quality	Return/Exchange Response Speed (PQ1)
	Compliance with Return Policies (PQ2)
	Return Service Accuracy (PQ3)
Consumer Cost	Process Ease of Use (CC1)
	Reasonable Logistics Cost Allocation (CC2)
	Reduction in Return Hassles (CC3)

3. Evaluation of return logistics service quality

The survey questionnaire adopted a 5-point Likert scale, asking respondents to select from five levels ranging from "Strongly Disagree" to "Strongly Agree." Distributed via Qwixx, the survey ultimately collected 250 responses. After excluding 37 invalid questionnaires, 213 valid responses were obtained, achieving an effective recovery rate of 85.2%.

3.1. Basic information

The survey sample comprised 60.6% females and 39.4% males, with over 60% aged 18-30 years old. In terms of education, 62.9% of respondents had a bachelor's degree or above, and their occupations were mainly corporate employees (36.6%) and students (28.6%). In terms of consumption characteristics, respondents' monthly income was concentrated in the range of 2001-6000 yuan, 83.5% had more than 3 years of online shopping experience, and returned goods were mainly discretionary purchases and daily consumer goods. The sample structure is reasonable and lays a solid foundation for subsequent empirical analysis.

3.2. Reliability and validity testing of the questionnaire

3.2.1. Reliability testing

This study employed SPSS 27 software to calculate Cronbach's Alpha reliability coefficients, testing the internal consistency and validity of the survey data. **Table 2** indicates that the reliability coefficients for all latent variables exceeded 0.8, meeting reliability testing standards. The data demonstrated good internal consistency and reliable validity.

Table 2. Reliability analysis results.

Primary Indicators	α Coefficient
Return Policy	0.911
Communication Quality	0.898
Process Quality	0.887
Consumer Cost	0.831

3.2.2. Validity testing

To examine the structural validity of the return logistics service quality scale, this study employed exploratory factor analysis using SPSS 27.0. KMO and Bartlett's sphericity tests were first conducted to assess data suitability for factor analysis. The results are presented in **Table 3.**

Table 3. KMO and bartlett's test.

KMO Value		0.853
Bartlett's Sphericity Test	Approximate Chi-Square	1804.432
	df	91
	p-value	0.000

The KMO value for the survey data was 0.853, exceeding the acceptable threshold of 0.70 and meeting the prerequisite for factor analysis. The approximate chi-square value from Bartlett's sphericity test was 1804.432, with a significance level of 0.000 ($p<0.001$). The result indicates significant correlations among variables, confirming suitability for factor analysis. These results collectively demonstrate that the scale developed in this study possesses good construct validity.

Four valid factors with eigenvalues greater than 1 were extracted, with the rotated variance explanation rates of 22.715%, 21.993%, 17.517% and 16.164% respectively, and the cumulative variance explanation rate reached 78.389%, which was consistent with the four latent variables of the research model. The weights of the four factors were 0.290, 0.281, 0.223 and 0.206 after normalization.

Table 4. Rotated factor loadings table.

Primary Indicators	Secondary Indicators	Factor Loadings			
		Factor 1	Factor 2	Factor 3	Factor 4
Return Policy	RP1	0.879	0.075	0.024	0.176
	RP2	0.858	0.123	0.054	0.211
	RP3	0.864	0.114	0.066	0.152
	RP4	0.850	0.169	0.060	0.120
Communication Quality	CQ1	0.195	0.827	0.207	0.030
	CQ2	0.037	0.851	0.136	0.081
	CQ3	0.166	0.838	0.139	0.104
	CQ4	0.094	0.880	0.102	0.134
Process Quality	PQ1	0.111	0.223	0.857	0.076
	PQ2	-0.026	0.139	0.895	0.091
	PQ3	0.090	0.149	0.881	0.169
Consumer Cost	CC1	0.188	0.163	0.086	0.836
	CC2	0.196	0.103	0.088	0.816
	CC3	0.179	0.033	0.154	0.840

Table 4. indicates that all variables exhibit a commonality coefficient above 0.5, suggesting strong correlations between variables and factors. Based on the matching principle where factor loadings exceed 0.5 in absolute value, the return policy, communication quality, process quality, and consumer cost respectively correspond to factors 1 through 4, forming a four-factor structure. This validates the questionnaire's sound reliability and validity.

3.3. Evaluation results analysis

This study employed factor analysis to extract common factors and maximize variance rotation for each dimension indicator. Based on the variance contribution rate of each factor and the factor loadings of indicators on their corresponding factors, the comprehensive weights for primary and secondary indicators were calculated. This reflects the relative importance of each indicator within the consumer return service evaluation system. Specific weighting results are shown in **Table 5**.

Table 5. Weight analysis results.

Primary Indicator	Weight	Secondary Indicators	Weight
Return Policy	0.290	RP1	0.071
		RP2	0.076
		RP3	0.073
		RP4	0.074
Communication Quality	0.281	CQ1	0.077
		CQ2	0.067
		CQ3	0.076
		CQ4	0.073
Process Quality	0.223	PQ1	0.073
		PQ2	0.062
		PQ3	0.073
Consumer Cost	0.206	CC1	0.071
		CC2	0.067
		CC3	0.067

3.3.1. Evaluation results of primary indicators

Based on the weights of primary indicators, return policies and communication quality carry the highest weights, serving as core factors influencing consumer evaluations of return services. Process quality holds a moderate weight and plays a significant supporting role. Consumer costs carry the lowest weight and exert relatively minor influence.

3.3.2. Evaluation results of secondary indicators

The weighting results indicate that factors such as timely customer service response, reasonable return policy provisions, and service attitude carry higher weight. This suggests that when evaluating return services, consumers prioritize customer interaction quality and fairness of return policies as core influencing factors. Indicators like the reasonableness of return deadlines and consistency in service attitude have moderate weight, playing stable but relatively secondary roles. Factors such as compliance with return rules and logistics cost sharing carry lower weight, indicating weaker consumer sensitivity. Overall, consumer evaluations of return services center on customer service quality and policy fairness, with process execution and experience serving as supporting factors. To enhance service quality, priority should be given to key dimensions like customer response times, service attitude, and policy standardization.

4. Conclusion

This study constructs and empirically analyzes an evaluation system for E-commerce return logistics service quality using Taobao as a case study. The findings reveal that return policies and communication quality are the core primary indicators influencing consumer perception. Secondary indicators such as timely customer service response and reasonable return reasons hold significant weight, while process quality and consumer costs provide secondary support. Accordingly, E-commerce platforms should prioritize refining return policies and enhancing customer service communication and response efficiency. Concurrently, optimizing return procedures and reasonably allocating consumer costs will elevate return logistics service quality, thereby strengthening consumer trust and platform competitiveness.

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