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University Students' Satisfaction with Double Eleven Logistics: An IPA Analysis of JD.com -- Take LNNU Students as an Example

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ABSTRACT: *This study focuses on customer satisfaction with JD.com's logistics services during the "Double Eleven"(11.11) online shopping festival. Using students from Lingnan Normal University (LNNU) as the research sample, data were collected through a questionnaire survey based on an evaluation system comprising four dimensions and 16 specific indicators. An Importance-Performance Analysis (IPA) was employed for in-depth analysis. The findings reveal that the student cohort prioritizes the convenience and timeliness of the final-mile delivery service. JD Logistics demonstrates strengths in the quality of physical product delivery but exhibits shortcomings in system resilience under the pressure of large promotional events. The IPA matrix analysis shows a differentiated distribution of indicators across the four quadrants. Based on these results, recommendations are proposed for JD Logistics, including enhancing the efficiency of delivery personnel, optimizing the return and refund processes, improving issue resolution mechanisms, increasing pricing transparency, maintaining efficient and accurate delivery services, and upgrading the logistics information system. These suggestions aim to improve the service quality and customer satisfaction of JD Logistics during the "11.11" period, providing insights for the e-commerce logistics industry in serving the student demographic.*

Keywords*: JD Logistics; Double Eleven (11.11); Customer Satisfaction; Importance-Performance Analysis (IPA)*

INTRODUCTION

With the rapid advancement of information technology, the e-commerce industry has experienced explosive growth globally. In China, the market scale of e-commerce has continued to expand, leading to intense competition among various online platforms. JD.com's "Double Eleven" (11.11) shopping festival, an annual flagship event in the e-commerce sector introduced in 2009, has seen its online transaction volume grow year by year. This surge in transaction volume inevitably leads to a dramatic increase in the number of express packages. During the 11.11 period, the nationwide express package collection volume surges, often breaking single-day business volume records. This phenomenon not only reflects the robust productivity of e-commerce but also presents a substantial market opportunity coupled with significant challenges for the logistics industry.

The final completion of e-commerce transactions is intrinsically linked to logistics services, with the quality of these services directly impacting customer shopping experiences. For consumers, prompt and accurate high-quality service can enhance their goodwill and trust towards the e-commerce platform, thereby increasing customer satisfaction. Conversely, any lapse or inadequacy in the logistics process may lead to customer dissatisfaction, potentially hindering subsequent business activities and damaging the platform's reputation (Shang, 2024).

As one of China's leading e-commerce platforms, JD.com has invested heavily in the logistics sector, establishing its proprietary logistics system—JD Logistics. Renowned for its efficient delivery network, advanced warehousing management, and high-quality service, JD Logistics has garnered significant industry recognition. Furthermore, during the 11.11 period, JD.com faces the immense pressure of handling a massive volume of orders. Its service performance during this peak season directly influences its competitiveness in the fiercely contested e-commerce market (Zhu, 2024).

This study focuses on JD.com's logistics services during the 11.11 festival, using students from Lingnan Normal University (LNNU) as the research sample. The research aims to achieve the following objectives:

(1) **Develop a Satisfaction Evaluation Framework:** To construct a satisfaction evaluation system tailored for online logistics services during the 11.11 festival, specifically designed for the LNNU student demographic. By clearly defining indicators at various levels, this framework aims to comprehensively and systematically measure students' satisfaction with JD.com's 11.11 logistics services, providing a robust foundation for subsequent analysis.

(2) **Analyze Service Strengths and Weaknesses**: To utilize the Importance-Performance Analysis (IPA) methodology to conduct an in-depth analysis of the performance of 11.11 logistics services across various indicators. This approach seeks to precisely identify service strengths and areas for improvement, clarifying which aspects are well-received by students and which require enhancement. The findings will provide a basis for targeted service optimization strategies.

LITERATURE REVIEW

2.1 Customer Satisfaction

Scholar Cardozo (1965) first introduced the theoretical concept of customer satisfaction, proposing that satisfaction is the outcome of expectations, which are partly derived from prior experiences. This relationship implies that expectations are predicated on experience, thereby initiating the study of customer satisfaction. Following an extensive survey of consumer data from over one hundred enterprises, Churchill and Surprenant (1982) found that customer satisfaction is reflected in the perceived state resulting from a comparison between the psychological expectations formed post-purchase and the actual outcomes obtained from the consumption of goods or services.

In the current academic landscape, research on the definition of customer satisfaction has primarily coalesced into two mainstream perspectives. The first perspective defines customer satisfaction from a state-based viewpoint, conceptualizing it as the post-purchase perception an individual forms after fully experiencing the consumption process. For instance, Oliver and Linda (1981) posited that customer satisfaction is the psychological state experienced when expectations, formed based on past experiences, align with actual perceptions. Similarly, Westbrook et al. (1983) described customer satisfaction as an affective response, specifically manifesting as the influence perceived external environmental factors exert on an individual's internal psychological state during the consumption process.

The second perspective adopts a process-oriented approach, defining customer satisfaction as a post-service evaluation. For example, Engel and Blackwell (1982) regarded customer satisfaction as the evaluation made by consumers when the purchased product aligns with their expectations. Furthermore, Tse and Wilton (1988) conceptualized customer satisfaction as the comparison between actual perceptions and expected outcomes, focusing on the gap between the two.

2.2 Current Status of Customer Satisfaction Research

Since the 1980s, International scholars have proposed a series of customer satisfaction models based on relevant theories and empirical research to explain the formation mechanism of customer satisfaction. Kano (1984) proposed that customer satisfaction is closely related to product quality, and categorized product quality into subjective and objective aspects to study their corresponding relationships, thereby establishing the Kano model. Fornell (1986) proposed that customer satisfaction is a cognitive psychological experience formed by comparing the actual feelings customers obtain after purchasing and using products or services with their expectations. He extended the study of customer satisfaction from the marketing field to the field of consumer psychology, ushering in a new era for related research. The Fornell model, which integrates mathematical operational methods and psychological perception theories, is proposed. The index derived from its solution is the Customer Satisfaction Index (CSI). In the same year, Fornell developed a nationwide customer satisfaction index model: the Sweden Customer Satisfaction Barometer (SCSB). This model represents the earliest customer satisfaction model, integrating mathematical operational methods with customer psychological perception theories, thereby rendering customer satisfaction a measurable concept (Fornell, 1992). Building upon the SCSB model, Fornell et al. (1996) proposed the American Customer Satisfaction Index (ACSI). Currently, this model has become a widely utilized framework for evaluating customer satisfaction. In Europe (2000), the European Customer Satisfaction Index (ECSI) was established. This model quantifies customer satisfaction by surveying customers' levels of satisfaction with products or services, converting these levels into numerical indicators, thereby forming a system of quantitative metrics to assess the degree of customer satisfaction (Johnson et al., 2001). In China, the China National Institute of Standardization and Tsinghua University jointly developed the China Customer Satisfaction Index (CCSI) in 2003 (Liu & Wang, 2024). The development of customer satisfaction has evolved from its introduction into the field of marketing to becoming a key element of core competitiveness. Customer satisfaction is a dynamic and ever-changing indicator. Therefore, only by continuously understanding the satisfaction factors influencing various consumers regarding products under different circumstances can the maximum level of consumer satisfaction be achieved.

Currently, international research tends to focus more on the construction of theoretical models and the application of empirical analytical methods. Gbene (2023), utilizing the SERVQUAL model to collect sample data, analyzed customer service satisfaction within logistics enterprises. The findings indicated that customer satisfaction exhibited the strongest positive correlations with convenience, privacy, and timeliness, while showing moderate associations with rapid collection capabilities and rapid accessibility. Zhou (2023) applied a multifactor analysis approach to examine the impact of Amazon customers on its customer satisfaction and business performance. The study identified factors such as service quality, service attitude, perceived value, service speed, and shipping speed as having a direct influence on both customer satisfaction and corporate business performance. Saram and Kyunghwa (2023), based on the ACSI model, developed a customer satisfaction evaluation system for modern enterprises. This system investigated issues related to customer satisfaction within contemporary businesses across multiple dimensions—including corporate brand, product quality, service capabilities, and the value utility derived from these services—and proposed corresponding strategies.

In recent years, Chinese scholars have achieved significant progress in the study of customer satisfaction, yielding a wealth of academic outcomes. Shi and Guo (2021), based on the UTAUT model, analyzed user behavior in logistics companies such as STO and Deppon, discovering that perceived ease of use significantly influenced customers' intention to use

logistics services. They proposed strategies to enhance customer satisfaction, including improving convenience, increasing perceived ease of use, and strengthening personal information security. Xu (2022), through research on the campus logistics service satisfaction of university students, demonstrated that students are a major consumer group for logistics and express service, highlighting that logistics companies face greater opportunities and challenges amidst China's transition towards high-quality economic development. Li et al. (2023), during a survey of community group buying customers for STO and ZTO, found that customers were most concerned with the protection of personal information and the speed of goods delivery. They recommended enhancing convenience and network coverage, strengthening user privacy protection, and improving user experience to boost customer satisfaction. Wu et al. (2023) posited that various factors, including corporate reputation, brand influence, service capabilities, service attitude, customer communication, and customer care, are primary determinants of customer satisfaction in modern logistics enterprises. They advocated for logistics companies to establish a scientifically sound and rational customer satisfaction system, clearly defining the weight levels of various influencing factors, and optimizing adjustments to enhance customer satisfaction. Furthermore, Pan and Hu (2018), within the context of the "11.11" shopping festival, analyzed customer satisfaction regarding online shopping logistics services, revealing the challenges faced by logistics services during peak periods and the corresponding strategies. Xiao and Weng (2024), using JD Worldwide as a case study, conducted a systematic evaluation of logistics service quality through online review data on cross-border e-commerce platforms, highlighting the crucial role of customer feedback in optimizing logistics services.

2.3 Importance-Performance Analysis (IPA)

Importance-Performance Analysis (IPA), proposed by Martilla and James (1977), is a methodology employed for satisfaction survey analysis. It involves respondents evaluating the same performance indicators on both importance and performance (or satisfaction) scales. When applied to satisfaction assessment, the performance dimension effectively represents satisfaction levels. In recent years, owing to its objectivity and intuitive nature, IPA has been widely adopted in marketing research. It allows for an analysis of consumers' actual perceptions towards brands and products from a data-driven perspective, enabling an effective evaluation of the practical outcomes of marketing efforts for businesses and brands. Consequently, it facilitates the generation of targeted recommendations for improving marketing strategies (Dai et al., 2023).

In practical application, the process begins by identifying the observational variables for the study. Subsequently, through questionnaire surveys and data analysis, the importance and satisfaction scores for each variable are determined. An IPA plot is then constructed with Satisfaction on the X-axis and Importance on the Y-axis, plotting each variable as a point on the graph. The mean values for Importance and Satisfaction across all variables are calculated, and these averages serve as reference lines to divide the plot (Figure 1) into four quadrants (Che, 2024).

- **Quadrant I (Strength Zone):** Characterized by high Importance and high Satisfaction scores, representing competitive advantages that should be maintained and potentially enhanced.
- **Quadrant II (Maintain Zone):** Features low Importance but high Satisfaction scores. Resources allocated to these areas might be excessive, and efforts could potentially be redirected unless strategic reasons dictate otherwise.
- **Quadrant III (Opportunity Zone):** Both Importance and Satisfaction scores are relatively low. These areas may represent low-priority issues or opportunities for improvement if their importance is expected to grow.
- **Quadrant IV (Improvement Zone):** High Importance but low Satisfaction scores indicate areas where performance is lagging significantly behind expectations. These are critical areas requiring immediate attention and improvement efforts (Pan & Lin, 2024).

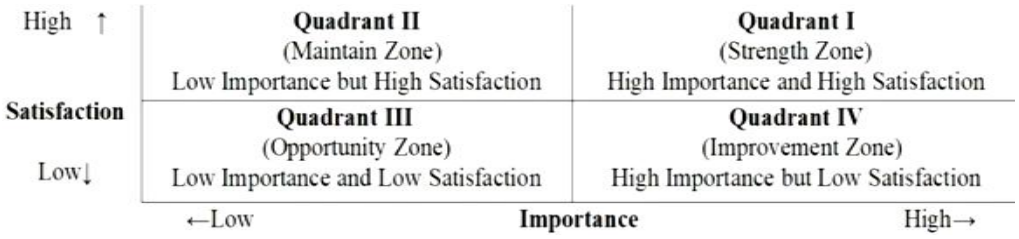

Figure 1: IPA Analysis Method Quadrants

METHODOLOGY

3.1Research Subjects

3.1.1 The Student Population of LNNU

LNNUis a historic provincial undergraduate teacher training institution located in Zhanjiang City, Guangdong Province. As of March 2025, the university has over 25,000 full-time undergraduate and associate degree students, spanning 10 major

academic disciplines across 32secondary colleges. The student population primarily falls within the age range of 17 to 25, exhibiting high consumer vitality. Furthermore, a JD Logistics parcel point is conveniently located on campus, providing a readily accessible research environment and a rich source of potential participants for this study.

The selection of LNNU students as the research subjects was primarily based on the following considerations: Firstly, the college student demographic represents a dominant force in the current online shopping market. They exhibit a high receptiveness to novel concepts, possess diverse consumption needs, and demonstrate active participation in online shopping. Secondly, this group originates from various regions and academic disciplines, offering a diverse consumer background. This diversity allows the study to capture both the commonalities and variations in the online shopping logistics service experiences among university students. Lastly, during the 11.11 shopping festival, there is a significant surge in student online orders. Consequently, students hold heightened expectations regarding the timeliness and quality of logistics services. Therefore, investigating their satisfaction holds significant importance for enhancing the service quality of JD Logistics and fostering loyalty within the student demographic.

3.1.2 Overview of JD Logistics

As a self-operated logistics system under the Jingdong Group, JD Logistics has been continuously optimized and upgraded since 2007. It has now developed into an enterprise boasting six major logistics networks: large item, medium and large item, B2C, cross-border, and crowd-sourced (Jin et al., 2025). As of 2020, JD Logistics operated over 900 warehouses and 5,367 delivery stations and pickup points nationwide, with its business covering more than 30 provinces and 200 cities, demonstrating a continuously expanding service scope.

JD Logistics is committed to building a comprehensive and multi-tiered delivery system, with its network covering 98% of the national population. Relying on its vast warehousing scale and the strategic layout of seven major logistics centers (Beijing, Shanghai, Guangzhou, Shenyang, Wuhan, Xi'an, Chengdu), JD Logistics achieves extensive geographical coverage and efficient delivery services (Li, 2022). Furthermore, JD Logistics offers diverse delivery services, including doorstep delivery, pickup services, as well as options like next-day delivery, night delivery, and ultra-fast delivery, continuously enhancing service quality to meet the increasingly growing demands of consumers.

3.2 Questionnaire

3.2.1 Evaluation Index System

According to the research objectives and the complexity of the surveyed population, this study categorizes the consumer satisfaction evaluation indicators for JD Logistics during the 11.11 shopping festival into three hierarchical levels: the target level (A) as the first tier, representing overall consumer satisfaction; the element level (B) as the second tier; and the indicator level (C) as the third tier. Additionally, a three-tier evaluation index system is established, comprising four element-level categories and fifteen specific evaluation indicators to assess the characteristics of consumer satisfaction. The details are presented in Table 1.

Table 1 Evaluation Index System and Codes

Target Level (A)	Element Level (B)	Indicator Level (C)
11.11 Online Shopping Logistics Customer Satisfaction (A)	Delivery Timeliness (B1)	Speed of product delivery (C1) Punctuality of delivery (C2) Real-time tracking and interaction during delivery process (C3)
	Logistics Information Service (B2)	Transparency of logistics information (C4) Timeliness of delivery information updates (C5) Level of charge pricing (C6) Diversity and transparency of charging methods (C7)
	Service Level (B3)	Attitude of delivery personnel (C8) Work efficiency of delivery personnel (C9) Complexity of return and refund procedures (C10) Coverage range of logistics delivery services (C11) Satisfaction with doorstep delivery fulfillment (C12) Handling of related issues during the delivery process (C13)
	Parcel Quality (B4)	Degree of product intactness (C14) Degree of intactness of outer packaging upon arrival (C15) Accuracy of delivered goods and quantities (C16)

3.2.2 Questionnaire Design and Pre-testing

The questionnaire for this study was designed based on the preceding discussion and a review of the literature. The questionnaire consists of two main parts. The first part investigates consumer perceptions of satisfaction. Utilizing the

established evaluation index system, it surveys consumers' expectations (importance) and performance (satisfaction) regarding 11.11 online shopping logistics. A 5-point Likert scale was employed for measurement (1 = Very unimportant/Very dissatisfied, 5 = Very important/Very satisfied). The second part collects demographic characteristics of the consumers, including variables such as gender, age, and frequency of online shopping.

The research was conducted in two phases. Initially, a pilot questionnaire was distributed. A sample of 30 students was selected for the pre-survey. All 30 questionnaires were returned, yielding 30 valid responses, resulting in a 100% response rate and 100% data validity. After completing the questionnaire, each participant was interviewed to ascertain whether they could accurately understand the meaning of each item within the questionnaire.

Following the pre-survey, the pilot questionnaire was finalized and used as the formal questionnaire. A total of 320 questionnaires were distributed via Wenjuanxing (a popular online survey platform in China), and 300 were recovered. After excluding invalid responses due to excessively short completion times or incomplete data, a final set of 283 valid questionnaires was obtained, representing an effective response rate of 94.33%.

RESULTS

4.1 Reliability and Validity Analysis

Reliability analysis was conducted on the collected questionnaire data using SPSS 27.0 software, with the results presented in Table 2. Since the questionnaire employed in this study utilizes a 5-point Likert scale, homogeneity reliability, specifically the internal consistency coefficient, was used to assess the consistency among all items. The statistical measure employed was Cronbach's Alpha coefficient. Generally, a Cronbach's Alpha coefficient greater than 0.7 is considered acceptable for questionnaire reliability. The results yielded a Cronbach's Alpha value of 0.939, which exceeds 0.9, indicating that the questionnaire items exhibit good reliability and are suitable for further research analysis.

Table 2 Cronbach's Alpha Coefficient

Cronbach's Alpha Coefficient	Std Cronbach's Alpha Coefficient	Number of Items
0.940	0.940	32

This study employed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity to assess the suitability of the data for factor analysis. The results indicated that the KMO value was 0.944, exceeding the threshold of 0.7, which suggests a high degree of intercorrelation among the variables. Furthermore, the significance level of Bartlett's test of sphericity was extremely close to zero (see Table 3), indicating that the data selected for this research meet the requirements and are appropriate for factor analysis.

Table 3 KMO Measure and Bartlett's Test of Sphericity

KMO		0.947
Bartlett's Test of Sphericity Approxt	chi square	3326.997
	df	496
	Sig	0

4.2 Sample Characteristics

The gender distribution in the survey sample was relatively balanced, with a ratio of approximately 1:1, slightly favoring males. This indicates a broadly representative gender distribution within the sample. Regarding age, the majority of respondents fell within the 18-21 age range. This distribution aligns with the target population of the survey, which consisted of undergraduate students at LNNU, whose typical age range is 17 to 22. Over seventy percent of the sample reported making online purchases three or more times per month, suggesting that online shopping has become a significant mode of consumption in the daily lives of university students and that the sample exhibits strong online purchasing habits. Furthermore, more than half of the sample had an online shopping history exceeding three years, indicating the continuity of online purchasing behavior among university students. This also suggests that the sample possesses a substantial basis of experience and perception regarding logistics services, thereby enhancing the reliability of the data (as shown in Table 4).

Table 4 Characteristics of the Sample

Basic Characteristics		Frequency	%
Gender	Male	147	51.94
	Female	136	48.06
Age	Under 18	121	42.76
	18-21	113	39.93
	21-24	49	17.31
Average Monthly Online	2 times or fewer	39	13.78

Purchase Frequency	3-5 times	100	35.34
	6-8 times	109	38.52
	9times or more	35	12.37
Online Shopping History	2 years or less	52	18.38
	3 to 5 years	162	57.24
	6 years or more	69	24.38

4.3 Analysis of Importance and Satisfaction Levels

Based on the Importance-Performance Analysis (IPA) method and the respondents' satisfaction evaluations of the evaluation indicators, the IPA analysis results table (see Table 5) was constructed. Examining the mean P-I differences, the indicators C1, C2, C8, C14, and C15 exhibit positive mean differences between satisfaction (P) and importance (I). This indicates a relatively high level of consumer recognition or satisfaction with these aspects. Conversely, the mean P-I differences for the other 11 indicators are all negative, suggesting that there remains room for improvement and enhancement in the logistics services provided during the 11.11 shopping period.

Table 5 IPA Analysis Results

Indicator	Importance（I）			Satisfaction（P）			P-I(Mean
Level	Mean	Rank	Std. Dev.	Mean	Rank	Std. Dev.	Difference
C1	3.49	13	1.351	3.56	5	1.280	0.07
C2	3.55	9	1.291	3.61	2	1.284	0.06
C3	3.62	3	1.395	3.53	6	1.253	-0.09
C4	3.54	10	1.308	3.48	13	1.316	-0.06
C5	3.52	11	1.241	3.46	15	1.348	-0.06
C6	3.57	7	1.344	3.49	12	1.153	-0.08
C7	3.55	8	1.294	3.52	7	1.159	-0.03
C8	3.46	14	1.247	3.57	4	1.223	0.11
C9	3.62	2	1.298	3.49	11	1.403	-0.13
C10	3.58	6	1.267	3.51	9	1.273	-0.07
C11	3.43	16	1.403	3.37	16	1.243	-0.06
C12	3.64	1	1.277	3.52	8	1.233	-0.12
C13	3.59	4	1.278	3.47	14	1.342	-0.12
C14	3.59	5	1.258	3.63	1	1.299	0.04
C15	3.45	15	1.302	3.59	3	1.289	0.14
C16	3.52	12	1.330	3.50	10	1.284	-0.02
		Mean	3.545		Mean	3.519	

4.3.1 Analysis of Importance Indicators

According to the data presented in Table 5, the mean values for the importance indicators ranged from 3.64 to 3.42, with an overall average of 3.545. Among these, consumers identified the top three most critical factors for logistics during the 11.11 shopping period as C12 (3.64), C9 (3.62), and C3 (3.62). Conversely, the factors perceived as relatively less important (bottom three) were C11 (3.43), C15 (3.45), and C8 (3.46). This finding suggests that the majority of university students place significant emphasis on direct home delivery. Home delivery is perceived as a convenient service modality, reflecting the humanization and attentiveness of the logistics service, which directly impacts consumer satisfaction. Furthermore, efficient work by delivery personnel enables consumers to receive their goods more quickly, and in the context of fast-paced modern life, the reduction in time costs substantially enhances the overall shopping experience. The ability to monitor the delivery process in real-time allows consumers to better manage their schedules and arrange for timely package pickup. It appears that during online shopping, issues such as packaging condition and the conduct of delivery personnel are not the primary concerns for consumers. Instead, the timeliness of delivery and the integrity of the received goods are the paramount issues of concern.

4.3.2 Analysis of Satisfaction Indicators

Regarding the perceived satisfaction, the mean scores for the 16 indicators ranged from 3.37 to 3.63. This indicates some variability among the indicators, and notably, none exceeded a score of 4.0. This suggests that the online shopping experience for consumers on JD.com during the 11.11 period did not reach an ideal, flawless level. Among these, the indicators with the highest mean satisfaction scores were C14 (3.63), C2 (3.61), and C15 (3.45), while those with lower mean satisfaction scores were C11 (3.37), C5 (3.46), and C13 (3.47). This reveals that, despite the massive volume of packages during 11.11, JD.com successfully delivered goods intact to consumers, substantially meeting their core requirement regarding product usability. Furthermore, as a leading logistics enterprise, JD.com significantly satisfied

consumer demands concerning delivery timeliness. Although C15 exhibited a mean satisfaction score slightly lower than the first two, it remained at a relatively high level. This reflects consumer recognition of JD.com's efforts in packaging protection; even during peak logistics periods, the outer packaging is highly likely to remain intact, preventing damage.

4.4 IPA Quadrant Analysis

Building upon the aforementioned analyses, this study employs the Importance-Performance Analysis (IPA) method to conduct an in-depth investigation of the factors associated with each indicator level. Using the data obtained from the survey questionnaires, the mean values of importance (3.545) and satisfaction (3.519) were used as the origin of the coordinate axes. Importance was plotted on the X-axis, and satisfaction on the Y-axis, thereby dividing the scatter plot into four quadrants. The 16 evaluation factors were then positioned within these quadrants—namely, the Maintenance Zone,Strength Zone, Opportunity Zone, and Improvement Zone—based on their respective mean scores (Figure 3).

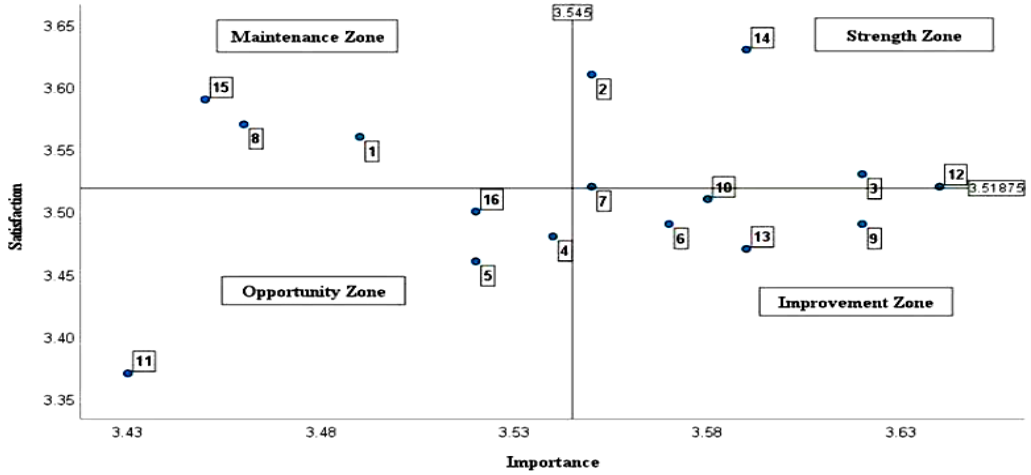

Figure 3 IPA Quadrant.0.

Quadrant I--Strength Zone (Maintain and Grow): The indicators in the Quadrant I exhibit both high importance and high satisfaction scores. These include C2, C3, C7, C12, and C14, totaling five indicators. This signifies that consumers perceive these aspects as both highly important and satisfactorily performed, representing JD Logistics' strengths. These areas should be maintained and continuously improved. However, considering the Satisfaction-Importance Mean Difference (P-I), indicators C3, C7, and C12 show negative P-I values, suggesting they require ongoing enhancement. Particularly, C7 and C12, located near the edge of this quadrant, warrant increased attention in future development.

Quadrant II--Maintenance Zone (Satisfy): This quadrant contains three indicators: C1, C8, and C15. Their defining characteristic is low importance but high satisfaction. This implies that consumers have relatively low expectations for these aspects, yet JD Logistics performs well in them. The strategy for these areas should involve moderate adjustment and control to preserve the current satisfactory level and sustain consumer contentment.

Quadrant III--Opportunity Zone (Low Priority, but Potential): The Quadrant III represents the low importance—low satisfaction region. It encompasses four indicators: C4, C5, C11, and C16. These factors hold relatively low importance and satisfaction ratings in consumers' minds and should not be prioritized for development. However, this does not imply they should be neglected entirely; improvements could potentially create opportunities to attract consumers. Within this quadrant, indicator C4 is closest to the mean importance value but receives unsatisfactory satisfaction scores. This suggests consumers have some expectations regarding this service but feel unmet. JD Logistics should improve its logistics information system to provide consumers with more intuitive access to tracking information.

Quadrant IV-- Improvement Zone (Prioritize Action): The Quadrant IV, designated the Improvement Zone, concentrates four indicators: C6, C9, C10, and C13. This quadrant is characterized by high importance but low satisfaction. This indicates that these aspects are highly valued by consumers, yet JD Logistics' performance in these areas falls short of expectations. These represent critical areas for future development and improvement for JD Logistics. Specifically, indicators C9 and C13, ranked second and fourth in importance respectively, are key concerns for consumers. JD Logistics should focus on training delivery personnel to enhance efficiency and simultaneously optimize the feedback system and problem resolution processes during delivery.

4.5 Discussion

The findings of this study indicate that university students place a high degree of importance on the convenience, timeliness, and information transparency of logistics services, particularly emphasizing the efficiency of the final-mile delivery and real-time tracking. Although the performance regarding product intactness and on-time delivery was acceptable, the overall satisfaction did not reach the threshold of 4.0. Notably, subpar performance in logistics information updates and issue resolution highlighted the shortcomings in the system's dynamic service capabilities during the 11.11 shopping festival.

The IPA analysis reveals that punctuality and product intactness represent core strengths for JD Logistics, although there remains room for enhancement. Certain indicators characterized by low importance and high satisfaction require maintenance. Indicators exhibiting both low importance and low satisfaction can be progressively improved. Conversely, indicators such as delivery efficiency and issue handling, which are highly important but result in low satisfaction, are critical areas requiring urgent resolution and directly impact the overall evaluation.

In summary, JD Logistics demonstrates a robust performance concerning physical product delivery. However, its capacity for information synchronization and responsiveness to issues proves insufficient under high order volumes. Future strategies should adopt a differentiated approach based on the IPA quadrants: consolidating strengths, maintaining stability, progressively refining areas with latent potential, and concentrating resources to address key improvement areas. This targeted strategy is essential for enhancing the satisfaction of university student users and strengthening market competitiveness.

CONCLUSION AND RECOMMENDATIONS

This study constructed a satisfaction evaluation system comprising 4 second-level elements and 16 specific indicators. By integrating the Importance-Performance Analysis (IPA) method, it conducted an in-depth analysis of customer satisfaction regarding logistics services during the "Singles' Day" shopping festival. The following main conclusions, contributions, and recommendations are drawn:

5.1 Indicator-Level Analysis

From the perspective of importance means: The average score of the 16 indicators was 3.545. The top three indicators were the fulfillment of the requirement for doorstep delivery (C1), the work efficiency of delivery personnel (C7), and real-time tracking interaction (C8), reflecting the core demands of the university student population for the convenience, timeliness, and information transparency of end-mile services. Indicators such as logistics coverage range (C11) and outer packaging intactness (C15) exhibited relatively lower importance, indicating that young consumers focus more on the essential aspects of service rather than peripheral attributes.

From the perspective of satisfaction means: The average score for the 16 indicators was 3.519. Indicators related to the quality of physical delivery, such as the intactness of goods (C14) and on-time delivery performance (C3), achieved the highest scores, validating the hard capabilities of JD Logistics' self-built warehousing and end-mile delivery system. However, dynamic service indicators like the timeliness of logistics information updates (C5) and the efficiency of issue resolution (C13) scored the lowest, exposing the shortcomings in the system's pressure-bearing capacity during major sales events and indicating that current resource allocation struggles to fully cope with extreme pressure scenarios. Furthermore, the fact that the mean satisfaction scores for all indicators failed to surpass the threshold of 4.0 suggests that the extreme order volume during Singles' Day exerts a certain impact on the quality of JD Logistics' service.

5.2 Results of the IPA Matrix Analysis

By establishing the mean values of importance and satisfaction (3.545, 3.519) as the origin of the coordinate system, the 16 indicators displayed a differentiated distribution:

Strength Zone (Quadrant I): This quadrant clustered 5 indicators, accounting for 31.25% of the total factors, including on-time delivery performance (C3) and goods intactness (C14). These indicators ranked highly in both importance and satisfaction, embodying the core competitiveness of JD Logistics. Notably, the goods intactness score reached 3.63, showcasing the technological advantages of the "Asia No.1" intelligent warehousing and distribution system.

Maintenance Zone (Quadrant II): This quadrant included 3 indicators, such as delivery speed (C1) and delivery attitude (C6), representing 18.75% of the total factors. Satisfaction exceeded importance by 0.09 standard deviations. The data indicates that most consumers appreciate services like JD's ultra-fast delivery, suggesting that maintaining the current service level through resource allocation is advisable.

Opportunity Zone (Quadrant III): This quadrant encompassed 4 indicators, including logistics coverage range (C11) and cargo accuracy (C16), constituting 25% of the total factors. These indicators showed low scores in both importance and

satisfaction. Analysis revealed the existence of service blind spots in rural end-mile delivery. These areas could be supplemented in future development.

Improvement Priority Zone (Quadrant IV): This quadrant concentrated 4 critical indicators, such as personnel efficiency (C7) and issue resolution (C13), representing 25% of the total factors, exhibiting a significant gap between high importance and low satisfaction. It can be inferred that delivery timeliness during major sales events tends to be longer than on normal days, highlighting an urgent need to optimize processes to break through service bottlenecks.

5.3 Research Significance

Theoretical Significance: This study deepens the application of service quality theory in the specific context of e-commerce logistics during peak periods (e.g., Singles' Day), providing refined empirical evidence for related models. It also fills gaps in previous research concerning the temporal dimension (focusing on daily operations while neglecting peak periods) and specific user groups (university students at LNNU). This contributes to the refinement of the theoretical framework for online shopping logistics satisfaction and offers a new perspective for understanding customer perceptions under different circumstances.

Practical Significance: By analyzing the satisfaction of students at LNNU, this research provides JD Logistics with a precise understanding of its service strengths and weaknesses during Singles' Day (e.g., delivery speed, package integrity), offering a basis for optimization decisions aimed at enhancing student loyalty. Simultaneously, given the industry-wide nature of the challenges posed by Singles' Day, the findings can serve as a reference for other e-commerce and logistics enterprises in managing peak periods, thereby promoting overall service improvement and efficient resource utilization within the industry.

5.4 Recommendations

Based on the aforementioned results, the following recommendations are proposed to enhance customer satisfaction with JD Logistics' delivery services:

Enhance Delivery Efficiency: Optimize the training system by implementing tiered and categorized training programs specifically designed for Singles' Day peaks. Utilize big data to forecast university orders and rationally allocate resources. Provide delivery personnel with intelligent assistants to plan optimal routes.

Optimize Return Processes: Establish a dedicated and expedited return channel within the JD app for Singles' Day, simplifying the application process, enabling rapid review, and allowing real-time tracking of return progress. Strengthen the management of returned items to accelerate resale.

Improve Issue Resolution: Build an integrated issue resolution platform that consolidates feedback channels for centralized and efficient handling. Enhance supervision and follow-up to continuously refine processes and reduce future issues.

Increase Pricing Transparency: Clearly state Singles' Day logistics charges, including fees for special services, on the app and website, and adjust prices reasonably based on costs.

Maintain Efficiency and Accuracy: Set delivery time limits based on distance, employ advanced tools and packaging to improve efficiency and reduce errors. Introduce automated sorting to minimize mistakes and product damage, ensuring on-time and intact delivery.

Upgrade Information Systems: Increase R&D investment to leverage technologies like blockchain and the Internet of Things (IoT) to enhance the accuracy, real-time nature, and transparency of information, while optimizing the information display interface.

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