

## Logistics Dimensions and Their Influence on Online Shopping Satisfaction: Evidence from Bandung, Indonesia

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**ABSTRACT:** The rapid growth of e-commerce in Southeast Asia, particularly in Indonesia, has transformed logistics into a critical factor shaping customer satisfaction. Yet, the specific contribution of individual logistics dimensions in urban Indonesian contexts remains underexplored. To address this gap, this study applies the SERVQUAL and Expectation Confirmation Theory (ECT) frameworks to examine how delivery speed, order accuracy, product condition upon arrival, tracking system effectiveness, and complaint responsiveness influence customer satisfaction among e-commerce users in Bandung. A quantitative survey of 100 active users was conducted, and data were analyzed using multiple linear regression. The results show that delivery speed ( $\beta = 0.337$ ,  $p < 0.001$ ), order accuracy ( $\beta = 0.172$ ,  $p = 0.002$ ), and product condition ( $\beta = 0.175$ ,  $p = 0.002$ ) significantly enhance satisfaction, while tracking and complaint responsiveness are not statistically significant; the model explains 57% of the variance ( $R^2 = 0.57$ ). These findings highlight that fulfillment-related dimensions are more decisive than post-purchase support in shaping consumer evaluations. This study contributes by contextualizing SERVQUAL and ECT within Southeast Asian urban e-commerce settings and provides actionable guidance: e-commerce platforms in Indonesia should prioritize delivery speed, order accuracy, and product condition as key drivers of customer satisfaction.

**Keywords:** Logistics Service Quality, Customer Satisfaction, E-Commerce, Last Mile Delivery, Urban Logistics.



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## INTRODUCTION

The exponential growth of e-commerce in Southeast Asia, particularly in Indonesia, has significantly transformed retail consumption and supply chain models. With a reported digital economy value of USD 82 billion in 2023, projected to reach USD 109 billion by 2025, Indonesia has emerged as the region's largest digital marketplace (Google and Temasek and Bain & Company, 2023). This surge has been driven by widespread internet penetration, mobile technology adoption, and shifting urban consumer behavior. Within this transformation, logistics

has evolved from a supporting function into a core strategic element that directly influences customer satisfaction, platform competitiveness, and operational sustainability.

As logistics becomes central to customer experience in the digital marketplace, its operational effectiveness manifested in timely delivery, real time order tracking, accurate fulfillment, and efficient complaint resolution emerges as a critical metric of service quality. In densely populated cities such as Bandung, these factors are subject to complex urban conditions including traffic congestion, limited infrastructure in residential areas, and inadequate integration of logistics technologies (Masudin et al., 2022; Tang et al., 2020). These inefficiencies have been noted to disproportionately impact the last mile delivery process, the final and most consumer visible stage in the e-commerce logistics chain, where even minor delays or errors can disrupt customer trust.

Bandung, a metropolitan city with over 2.5 million residents (BPS Kota Bandung, 2023), exemplifies the logistical challenges and opportunities of urban e-commerce logistics. The city's urban expansion, unaccompanied by proportional development of distribution infrastructure, has resulted in a high frequency of customer complaints, primarily about delayed shipments (37.2%), damaged goods (21.6%), and inaccurate tracking (16.8%), as reported by the Indonesian Logistics Association (ALI). While many e-commerce companies have invested in supply chain technologies and automated tracking systems, these solutions often fall short in resolving contextual urban issues, particularly those linked to physical accessibility and the unpredictability of delivery environments.

The strategic importance of last mile logistics cannot be overstated. As the interface between the digital platform and the consumer, it often shapes the customer's final impression of the service quality. External disruptions ranging from traffic and weather to unclear address systems can significantly hamper the last mile phase, making comprehensive logistics management a vital prerequisite for achieving customer satisfaction. Consequently, logistics has transitioned from an operational function to a competitive differentiator in the e-commerce (Uvet et al., 2023; Yu et al., 2023).

Modern urban e-commerce consumers, particularly from the millennial and Generation Z segments, exhibit heightened expectations for seamless and transparent service. This demographic shift has made logistics service quality a decisive factor in repurchase intention and brand loyalty (Duc et al., 2023; McKinsey & Company, 2022). These consumers prioritize convenience, speed, and responsiveness, valuing real time communication and proactive resolution mechanisms. As highlighted by Holloway (2024), supply chain agility and customer centric logistics models are pivotal in maintaining user engagement and trust, reinforcing the perception of logistics as a brand defining service.

Notably, while the relationship between logistics management and customer satisfaction has been extensively discussed in global contexts, there remains a dearth of localized empirical studies addressing this nexus in Indonesian urban settings. Prior studies often emphasize technical and operational efficiency, neglecting the subjective dimension of customer perception and experience (Kawa & Zdrenka, 2023). The absence of a consumer centric lens in evaluating logistics

performance limits the ability of platforms to design services that meet real user needs. As argued by Holloway (2024) and Kawa & Światowiec-Szczepańska (2021), deeper qualitative and hybrid approaches are needed to explore how logistics quality is internalized by consumers, especially in high growth, infrastructure challenged environments like Bandung.

Furthermore, literature indicates that key logistics service quality (LSQ) dimensions delivery speed, order accuracy, product condition at arrival, system tracking reliability, and responsiveness to complaints are strongly correlated with customer satisfaction in e-commerce (Masudin et al., 2022, 2022). However, few studies have simultaneously evaluated these factors within an urban Indonesian context, limiting the generalizability of existing findings. Moreover, generational differences in logistics expectations, especially among tech savvy users, have not been fully addressed in existing empirical models (Duc et al., 2023; Li, 2023).

In response to this gap, the present study investigates the influence of logistics management dimensions on customer satisfaction in the e-commerce sector of Bandung. The selected dimensions delivery speed, order accuracy, condition of received goods, tracking system reliability, and complaint responsiveness are operationalized through user perception and evaluated via quantitative analysis. By incorporating a survey based approach among 100 active users of major e-commerce platforms in Bandung, this research aims to elucidate how logistics performance affects consumer evaluations of service quality.

This study contributes to both academic and practical domains. Academically, it enriches the literature on logistics service quality by embedding it within the framework of customer satisfaction theories such as the SERVQUAL model (Parasuraman et al., 1988) and the Expectation Confirmation Theory (Oliver, 1980). These frameworks suggest that satisfaction emerges when service performance meets or exceeds customer expectations a proposition highly relevant in the context of on demand digital services. Practically, the study offers actionable insights for logistics and e-commerce managers seeking to optimize service operations in urban markets. Findings related to which logistics dimensions most significantly influence satisfaction can inform investments in systems and processes, including warehouse automation, inventory accuracy, packaging protocols, and digital communication tools.

Ultimately, the research advocates for a consumer driven logistics strategy one that recognizes logistics not merely as a backend function but as a customer facing value proposition. As the e-commerce sector in Indonesia matures, customer satisfaction will increasingly hinge on how platforms manage delivery expectations, resolve service breakdowns, and personalize the logistics journey. In the broader context of digital economic development, enhanced logistics services can boost consumer trust, reduce churn rates, and support sustainable e-commerce adoption in urban areas.

In summary, this research addresses a critical yet underexplored dimension of e-commerce service quality in Bandung. It proposes a structured, empirical inquiry into how specific logistics practices translate into perceived customer value, and how this, in turn, influences satisfaction. By capturing

localized data and integrating theoretical insights with real world logistics dynamics, the study offers a timely and relevant contribution to the evolving field of urban e-commerce logistics.

## **METHOD**

This study employs a quantitative explanatory survey design to assess the influence of logistics management dimensions on customer satisfaction in e-commerce services. The quantitative approach is suitable for hypothesis testing to validate theoretical assumptions under the SERVQUAL and Expectation Confirmation Theory (ECT) frameworks. This design enables systematic measurement and estimation of the extent to which delivery speed, order accuracy, product condition, tracking system reliability, and complaint responsiveness influence customer satisfaction.

The population targeted in this study comprises active users of e-commerce platforms residing in Bandung, Indonesia, who have conducted at least two online transactions within the last six months. The platforms include major players such as Tokopedia, Shopee, Lazada, and Bukalapak. As noted by the Indonesian E-commerce Association (idEA, 2023), Bandung ranks among the top five Indonesian cities with the highest number of e-commerce users.

A purposive sampling technique was used to select participants based on predetermined inclusion criteria: respondents had to be between the ages of 18 and 45, possess prior experience with online transactions, and express willingness to complete the research questionnaire. Using the Slovin formula with a 10% margin of error, the minimum required sample size was determined to be 100 respondents.

This study analyzes six variables five independent and one dependent. The independent variables consist of delivery speed, order accuracy, product condition upon delivery, tracking system performance, and complaint response efficiency. The dependent variable is customer satisfaction.

To ensure consistency in measurement, each variable is operationalized into specific indicators using a five point Likert scale, ranging from “strongly disagree” to “strongly agree.” The items reflect dimensions proposed in the SERVQUAL model (Parasuraman et al., 1988) and adapted for e-commerce logistics evaluation by researchers such as Kawa & Zdrenka (2023) and Masudin et al. (2022). Notably, the SERVQUAL model's flexibility allows for its refinement and adaptation to digital commerce, where service dimensions include speed, accuracy, and digital communication mechanisms (Kawa & Światowiec-Szczepańska, 2021).

Primary data were collected via an online questionnaire distributed through social media platforms, e-commerce user communities, and local forums in Bandung. The instrument consisted of two parts: demographic data (age, gender, frequency of purchases) and perceptual scales related to the five logistics service dimensions and customer satisfaction. Following a pilot test with 30 participants, the final questionnaire comprised, measured using a five-point Likert scale ranging from “strongly disagree” to “strongly agree.” The refinement ensured clarity, content validity, and

internal consistency prior to full-scale distribution. This process aligns with Holloway (2024) recommendation for incorporating ethical practices and demographic segmentation in logistics research methodologies.

Instrument validity was assessed using the Pearson Product Moment correlation method, which evaluates the degree to which individual questionnaire items correlate with the overall construct score. An item was considered valid if its correlation coefficient ( $r$ ) exceeded 0.3.

To assess reliability, the Cronbach's Alpha coefficient was computed for each construct. Constructs with alpha values above 0.7 were deemed sufficiently reliable for primary data collection, as recommended by Yu et al. (2023) in e-commerce logistics evaluations. The pilot test results confirmed that all items met the criteria for (Li, 2023) both validity and reliability.

The collected data were processed using SPSS version 26. Prior to regression analysis, classical assumption tests were conducted to ensure model adequacy. Normality was confirmed using the Kolmogorov–Smirnov test ( $p > 0.05$ ), while Variance Inflation Factor (VIF) values below 5 indicated the absence of multicollinearity. Heteroscedasticity tests also confirmed constant variance of residuals. Subsequently, multiple linear regression analysis was applied to evaluate the simultaneous and partial effects of the five independent variables on customer satisfaction, with significance set at  $\alpha = 0.05$ . As suggested by Kawa & Zdrenka (2023), such regression modeling offers clear insights into the relative contribution of each logistics service factor in shaping customer satisfaction outcomes.

The study was conducted in Bandung between August and October 2024. Bandung was selected due to its dynamic urban character, substantial e-commerce activity, and demographic diversity, making it a representative site for urban Indonesian consumers. All research activities from instrument development to data analysis were conducted online to enhance efficiency and expand respondent reach.

Ethical integrity was a central concern throughout the research process. Participants were briefed on the purpose and confidentiality of the study and were given the freedom to decline or withdraw from the questionnaire at any time. All responses were anonymized, and personal data were excluded from any further use beyond this research. These ethical safeguards ensured compliance with research standards and promoted respondent trust.

## **RESULT AND DISCUSSION**

### **Respondent Profile Distribution**

The study involved 100 respondents who were active users of e-commerce services in Bandung. As shown in Table 1, the gender distribution was nearly equal, with 51% identifying as female and 49% as male. Age wise, the largest group fell within the 18–25 years range (44%), followed by those aged 26–35 years (38%) and 36–45 years (18%). Regarding frequency of online shopping per

month, 50% reported shopping 3–5 times, 29% made 1–2 purchases, and 21% engaged in more than five transactions monthly. Shopee was the preferred platform for 46% of respondents, followed by Tokopedia (30%), Lazada (15%), and Bukalapak (9%).

**Table 1. Characteristic Distributive of Respondent**

Characteristics	Number	Percentage (%)
<b>Gender</b>		
Female	51	51.0
Male	49	49.0
<b>Age</b>		
18–25 years	44	44.0
26–35 years	38	38.0
36–45 years	18	18.0
<b>Monthly Shopping Frequency</b>		
1–2 times	29	29.0
3–5 times	50	50.0
>5 times	21	21.0
<b>Favourite Platform</b>		
Shopee	46	46.0
Tokopedia	30	30.0
Lazada	15	15.0
Bukalapak	9	9.0

*Primary Data 2024*

These findings align with the broader literature, which notes that younger, digitally savvy consumers are dominant in the urban e-commerce space, particularly in Southeast Asia (Duc et al., 2023; Pradana, 2022). Studies further highlight that frequent shoppers tend to develop brand loyalty and expectations based on prior experiences, reinforcing the need for consistent logistics performance (Guo et al., 2020; Sansaluna et al., 2024).

### Univariate Analysis

Univariate analysis was conducted to examine the distribution of each research variable based on mean, standard deviation, and score range. Table 2 shows that all variables scored a mean above 3.5, indicating generally favorable perceptions among respondents. Delivery speed received the highest mean score (4.21), followed closely by item condition (4.15) and order accuracy (4.08). Customer satisfaction also scored high (4.11), while the lowest average was for complaint responsiveness (3.75).



**Table 2. Univariate Statistics of Research Variables**

Variable	Mean	Standard Deviation	Min Score	Max Score
Delivery Speed	4.21	0.44	3.20	5.00
Order Accuracy	4.08	0.46	3.00	5.00
Product Condition	4.15	0.49	2.80	5.00
Tracking System	3.82	0.57	2.60	5.00
Complaint Service Responsiveness	3.75	0.62	2.50	5.00
Customer Satisfaction	4.11	0.51	3.00	5.00

Source : SPSS 26 Output

These results affirm findings in prior studies which identified delivery speed and accuracy as critical components influencing customer satisfaction in e-commerce contexts (Li, 2023; Nga & Vân, 2020; Oh et al., 2022). The use of Likert scales in this context allowed for systematic measurement of subjective perceptions, providing robust and interpretable data to inform logistics strategy (Lin et al., 2016).

### Bivariate Regression Analysis

The regression model was statistically significant ( $F = [\text{isi nilai } F\text{-statistic}]$ ,  $p < 0.001$ ) and explained 57% of the variance in customer satisfaction ( $R^2 = 0.57$ ), indicating good overall model fit.

**First**, delivery speed emerged as the strongest predictor ( $\beta = 0.337$ ,  $p < 0.001$ ), confirming its central role in shaping perceptions of reliability. This finding is consistent with *Ma et al. (2018)* and *Rashid & Rasheed (2024)*, who emphasized that speed directly drives customer satisfaction and loyalty in e-commerce.

Second, order accuracy also had a significant positive effect ( $\beta = 0.172$ ,  $p = 0.002$ ), underscoring the importance of precise fulfillment in minimizing mismatches and errors.

Third, product condition upon arrival significantly influenced satisfaction ( $\beta = 0.175$ ,  $p = 0.002$ ), highlighting the tangible quality dimension of SERVQUAL, where intact goods reinforce trust and service reliability.

By contrast, tracking system reliability ( $\beta = 0.079$ ,  $p = 0.170$ ) and complaint responsiveness ( $\beta = 0.048$ ,  $p = 0.421$ ) were not statistically significant. This suggests that these dimensions may function as *hygiene factors* necessary but not differentiating since customers tend to expect a baseline level of tracking and complaint handling as standard features.

**Table 3. Multiple Linear Regression Results**

Independent Variable	$\beta$ Coefficient	Std. Error	t-value	Sig. (p-value)
Delivery Speed	0.337	0.054	6.18	0.000 ***
Order Accuracy	0.172	0.054	3.19	0.002 **
Product Condition	0.175	0.055	3.18	0.002 **
Tracking System	0.079	0.057	1.38	0.170 (ns)
Complaint Service Responsiveness	0.048	0.059	0.81	0.421 (ns)

Source SPSS 26 Output

The model's adjusted  $R^2$  value was 0.57, suggesting that 57% of the variation in customer satisfaction can be explained by the five independent variables. These findings reinforce the importance of logistics execution in shaping e-commerce outcomes.

Ultimately, electoral logistics must be designed for resilience adaptive to environmental volatility and institutional complexity. Hybrid models, blending manual and digital tools, centralized oversight with decentralized execution, and formal policy with informal networks, represent the future of inclusive and reliable electoral delivery in fragmented geographies. The findings demonstrate that among the five logistics dimensions examined, delivery speed, order accuracy, and product condition significantly shape customer satisfaction, while tracking system reliability and complaint responsiveness do not. In Bandung a dense urban environment with high mobility challenges this pattern confirms that proactive fulfillment performance outweighs reactive service recovery mechanisms. Consumers expect fast, accurate, and intact delivery as baseline indicators of reliability, while features like tracking and complaint handling no longer differentiate satisfaction when the core service is consistently delivered.

The most prominent finding is the significant impact of delivery speed on customer satisfaction, which aligns with existing literature in both local and international contexts. The regression coefficient for delivery speed ( $\beta = 0.337$ ,  $p < 0.001$ ) confirms its role as the most influential logistics factor. This underscores that consumers, particularly in dense urban areas such as Bandung, equate timeliness with reliability. In the era of digital immediacy, fast delivery is not merely a convenience but a customer expectation (Ma et al., 2018; Rashid & Rasheed, 2024). The SERVQUAL model emphasizes reliability as one of the five core service dimensions, and delivery speed directly reflects this dimension. Furthermore, studies have shown that speed influences not just immediate satisfaction but also long term loyalty and repeat purchasing (Giasi et al., 2022).

Strategically, this result suggests that logistics optimization should prioritize smart route planning, local fulfillment centers, and partnerships with agile courier services, as highlighted by Mangiaracina et al. (2019). Platforms must consider integrating dynamic dispatch systems and offering delivery tracking transparency to satisfy speed sensitive consumers.

Equally significant is the role of order accuracy ( $\beta = 0.172$ ,  $p = 0.002$ ), which confirms the expectation confirmation theory (Oliver, 1980), where customer satisfaction arises when experiences meet or exceed expectations. Even minor discrepancies in product specifications can trigger dissatisfaction, especially in competitive digital markets where switching costs are low. E-commerce platforms must ensure inventory systems are synchronized with warehouse operations to minimize discrepancies. Automation technologies like barcode systems and AI assisted order matching can reduce human error, enhancing the perception of reliability (Adeniran et al., 2022).

In line with this, the physical condition of received goods ( $\beta = 0.175$ ,  $p = 0.002$ ) also significantly influences satisfaction. This dimension connects with the tangible quality aspect in the SERVQUAL framework. In e-commerce, where physical inspection is delayed until after purchase, any damage upon arrival heavily impacts customer trust. Studies indicate that packaging failures are among the most cited reasons for complaints and product returns (Duc et al., 2023;



Raharjo, 2020). Therefore, standardizing packaging protocols and offering additional protection options (e.g., bubble wrap or shipping insurance) can mitigate this issue. Moreover, visual verification at logistics checkpoints can increase transparency and consumer confidence.

In contrast, tracking system reliability ( $\beta = 0.079$ ,  $p = 0.170$ ) was not statistically significant in this study. This does not necessarily negate its relevance but may suggest that consumers consider it a basic feature, not a differentiator, unless it fails. Lin et al. (2016) and Vihari et al. (2023) emphasize that while tracking adds value, its contribution to satisfaction becomes salient only when integrated with other proactive communication mechanisms. The lack of significance here might also reflect a relatively high baseline of tracking quality across platforms in Bandung, making its variance less influential.

Similarly, complaint responsiveness ( $\beta = 0.048$ ,  $p = 0.421$ ) was not found to have a significant impact on satisfaction. One interpretation is that effective logistics performance preempts the need for complaints. As Oh et al. (2022) argue, service recovery mechanisms, while important, are secondary to proactive service excellence. This highlights a key strategic shift for e-commerce providers: invest in preventing issues rather than resolving them post hoc. Nonetheless, platforms should not disregard complaint systems, as their role may become critical in niche segments or high value transactions (Xu et al., 2024).

These results collectively reaffirm the theoretical interplay between SERVQUAL and Expectation Confirmation Theory in explaining customer satisfaction within logistics service contexts. SERVQUAL's emphasis on reliability and tangible quality aligns with the significant predictors identified, while ECT highlights the importance of meeting implicit consumer expectations speed, accuracy, and intact delivery (Rita et al., 2019).

This study extends the applicability of SERVQUAL and Expectation Confirmation Theory in the Southeast Asian e-commerce context. The results reinforce the primacy of the reliability dimension (delivery speed and accuracy) and the tangibility dimension (product condition) as dominant predictors of satisfaction in urban digital marketplaces. By contrast, tracking and complaint responsiveness appear to function as hygiene attributes important for maintaining baseline expectations but not sufficient to elevate satisfaction. This nuance highlights the need to recalibrate traditional service quality models for emerging markets, where logistics infrastructure and urban constraints strongly shape consumer expectations.

In sum, the study underscores the strategic shift from reactive service recovery to preventive service excellence in urban Indonesian e-commerce. Logistics quality should be reframed not merely as an operational support, but as a customer-facing value proposition that defines competitiveness in fast-growing digital economies.

## CONCLUSION

This study empirically demonstrates that delivery speed, order accuracy, and product condition significantly influence customer satisfaction in Bandung's e-commerce sector, while tracking and complaint responsiveness are not significant. The regression model explained 57% of the variance, highlighting that proactive fulfillment quality is more decisive than reactive service recovery in shaping consumer experience.

However, the study is limited by its single-city focus and quantitative design, which may not capture deeper behavioral dynamics across diverse urban contexts. Future research could adopt mixed-methods or conduct comparative studies across multiple Indonesian cities to enhance generalizability and capture richer insights. Uniquely, this study contextualizes SERVQUAL and Expectation Confirmation Theory within Indonesia's urban e-commerce environment, offering empirically grounded and actionable insights for platform optimization. By emphasizing delivery speed, order accuracy, and product condition as critical drivers, the findings provide both theoretical contributions and practical guidance for strengthening logistics competitiveness in Southeast Asia's digital economy.

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