

ANALYSIS OF THE IMPACT OF DELIVERY SPEED WITHIN SERVICE QUALITY ON E-COMMERCE CUSTOMER TRUST

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Abstract. This study examines the impact of delivery speed as a standalone dimension of service quality on customer trust within the Indonesian e-commerce sector. Amidst the rapid growth of digital transactions, logistics efficiency specifically timeliness and consistency has shifted from a service differentiator to a fundamental market standard. Using a quantitative explanatory research design, data were collected via structured surveys from 100 active e-commerce users through purposive sampling. The data were analyzed using simple linear regression and processed with SMARTPLS software. Descriptive results indicate high average values for both delivery speed (25.3858) and customer trust (39.3622), reflecting positive consumer perceptions. The inferential analysis confirms that delivery speed has a positive and significant effect on customer trust ($t = 5.480$, $p < 0.05$). The Adjusted R Square value of 0.886 reveals that delivery speed explains 88.6% of the variation in customer trust. These findings reinforce the theoretical importance of reliability and responsiveness in mitigating post-purchase uncertainty. Practically, the study underscores the necessity for e-commerce players to optimize last-mile logistics to sustain long-term digital business competitiveness.

Keywords: Delivery Speed, Customer Trust, E-commerce, Service Quality

I. INTRODUCTION

Digital transformation within the e-commerce sector has shifted the orientation of service quality from mere product quality toward the speed and reliability of logistical distribution as the primary determinant of customer experience [1]. Empirical research confirms that logistics service quality dimensions, including delivery service and reverse logistics, significantly enhance customer satisfaction and loyalty in digital markets by emphasizing reliability and timeliness as key factors [2]. The emergence of the instant consumption behavior phenomenon further strengthens the shift in consumer behavior, demanding instantaneous need fulfillment through e-commerce platforms [3]. Consequently, same-day/instant delivery speed has become a baseline expectation that no longer functions as a service differentiator but rather as a fundamental standard in market competition, as evidenced by its positive influence on satisfaction, loyalty, and brand image within the Indonesian context [4].

There are empirical indications that delivery delays, even of short duration, trigger a decline in customer trust due to increased perceived uncertainty in digital transactions [5]. This is reflected in customer complaints arising from delays, which lead to negative perceptions and a reduction in the level of trust in delivery services [6]. Furthermore, logistics service quality, particularly timely delivery, significantly influences customer trust and satisfaction on quick commerce platforms [7]. Moreover, delivery delays contribute to an increase in

perceived risk, which ultimately lowers consumer trust and purchasing decisions in e-commerce [8].

The rapid growth of e-commerce transactions has significantly increased the demand for fast and reliable delivery services, as evidenced by the transformation of consumer behavior in online purchasing, which drives increasingly higher delivery volumes [9]. Limitations in logistics capacity, particularly in the last-mile delivery phase, have emerged as a major challenge due to traffic congestion, high transportation costs, and shortages of labor and infrastructure that restrict overall operational efficiency [10]. This paradox reflects an imbalance between the rapid expansion of the e-commerce sector and inadequate logistics infrastructure, thereby creating various inefficiencies within increasingly complex supply chains [11]. Consequently, the implications of these issues include rising customer complaints regarding delivery delays and service dissatisfaction, which ultimately affect overall consumer loyalty and satisfaction [12].

Recent empirical data reveals that approximately 92.7% of consumer complaints are related to e-commerce services, indicating high levels of dissatisfaction in digital transactions [13]. The primary issue dominating these complaints is the delivery aspect, where delays frequently arise due to negligence in the logistics process [14]. In addition to delays, a lack of transparency regarding package status further exacerbates the consumer experience and creates post-purchase uncertainty [15]. This condition not only results in material losses for consumers but also impacts the decline of

trust and loyalty toward e-commerce platforms as a whole [16].

Customer trust serves as the primary currency in the e-commerce ecosystem, where its success depends on various service dimensions, including delivery speed [17]. Disruptions in the delivery speed dimension, such as delays, can significantly reduce consumer trust levels because delivery timeliness is a primary factor in building perceptions of platform reliability [18]. Empirical research indicates that logistics quality, specifically timely delivery, positively influences customer satisfaction and trust in quick commerce [7]. As a result, this has the potential to damage long-term relationships between consumers and e-commerce platforms through a sustained decline in loyalty [19].

Previous studies generally position delivery speed as part of a composite service quality variable without isolating its specific influence on customer trust [7]. Past research has focused more on customer loyalty or satisfaction, while the direct relationship between delivery speed and customer trust remains relatively limited and less explicit [20]. There is a limitation in studies using a quantitative explanatory approach to test the direct causal relationship between the variables of delivery speed and customer trust [21]. The Indonesian context, with its complex geographical characteristics and logistics infrastructure disparities, remains under-explored empirically in global literature, including the integration of recent phenomena such as the surge in expectations due to instant delivery [22].

A quantitative explanatory approach allows for the objective testing of cause-and-effect relationships between delivery speed and customer trust within the context of e-commerce consumer behavior [23]. The use of surveys with structured questionnaires provides the ability to capture customer perceptions directly and measurably on a large scale [24]. Simple linear regression analysis techniques are effective for identifying the magnitude of the influence of a single independent variable (delivery speed) on the dependent variable (customer trust) [25]. The utilization of statistical software such as SMARTPLS enhances the accuracy of data analysis as well as the validity and reliability of research results; thus, this research design enables the generalization of findings within the context of e-commerce consumer behavior, particularly regarding logistics dimensions [26].

This study aims to empirically analyze the influence of delivery speed as a dimension of service quality on customer trust within the e-commerce context, using a quantitative approach that allows for the measurable testing of causal relationships. Additionally, this research seeks to identify and measure the extent to which variations in delivery speed can explain changes in customer trust levels, thereby determining the relative contribution of this variable in forming trust perceptions. Conceptually, this study is also directed toward strengthening the position of delivery speed as a standalone determinant variable within the framework of customer trust formation, which has previously tended to be positioned as a general part of service quality without in-depth exploration. Furthermore, the results of this research are expected to produce relevant and applicable data-driven recommendations for e-commerce players and logistics service providers to improve service quality through the

optimization of delivery speed as a strategy to enhance customer trust..

II. RESEARCH METHODS

This study employs a quantitative approach with an explanatory research design to empirically examine the causal relationship between delivery speed—as an integral component of service quality—and customer trust within the Indonesian e-commerce landscape [27], [28]. Grounded in service quality theory, the research positions delivery speed as an operational indicator of reliability and responsiveness, which are hypothesized to be primary determinants of customer trust [19], [21]. Data was collected via a structured survey using a five-point Likert scale from 100 active e-commerce users selected through purposive sampling, specifically targeting those with transaction experience in high-intensity digital trade regions during both normal and peak periods [29], [30], [31], [32]. The independent variable, delivery speed (X), is measured through six items reflecting timeliness and consistency [28], while the dependent variable, customer trust (Y), is operationalized as the consumer's confidence in the provider's ability to fulfill promises securely and consistently [33], [34], [35], [36].

To ensure data integrity, the research instrument underwent rigorous validity and reliability testing using Pearson Correlation and Cronbach's Alpha ($\alpha > 0.70$) prior to analysis [37], [38]. Statistical processing was conducted using SMARTPLS software, encompassing descriptive analysis, classical assumption tests, and simple linear regression to evaluate the influence of X on Y [39]. The relationship is modeled by the equation $Y = a + bX + e$, a parsimonious approach deemed most appropriate for interpreting the causal link between these two primary variables [40]. The core hypothesis (H1) posits that delivery speed has a positive and significant effect on customer trust, supported by empirical evidence suggesting that rapid delivery cycles and punctuality are critical in mitigating uncertainty and reinforcing consumer confidence in digital transactions [7].

III. RESULT AND DISCUSSION

Table 1. the descriptive statistical analysis results

variable	N	Minimum	Maximum	Mean	Std. Deviation
X1.1	100	1.00	5.00	4.1654	1.00604
X1.2	100	1.00	5.00	3.8976	1.05285
X1.3	100	1.00	5.00	4.2913	0.90071
X1.4	100	1.00	5.00	4.2441	0.98976
X1.5	100	1.00	5.00	4.3780	0.88128
X1.6	100	1.00	5.00	4.4094	0.79036
TOTAL X (Delivery Speed)	100	7.00	30.00	25.3858	4.43301
TOTAL Y (Customer Trust)	100	15.00	45.00	39.3622	5.87795

Based on the descriptive statistical analysis results in Table 1, the delivery speed variable as the independent variable shows high average values across all indicators, remaining above 3.8, with a total mean value of 25.3858. This

indicates that respondents generally have a positive perception of delivery speed performance in e-commerce services, encompassing aspects of timeliness, consistency, and distribution process speed. Meanwhile, the customer trust variable as the dependent variable also demonstrates a high average value of 39.3622, reflecting a relatively strong level of respondent confidence in the reliability of e-commerce services. The relatively low standard deviation values for both variables indicate that respondents' answers tend to be homogeneous, thus demonstrating good data consistency. These findings provide an adequate empirical basis to proceed with inferential analysis to test the influence of delivery speed on customer trust.

Description	Value
N	100
Test Statistic	0.089
Asymp. Sig. (2-tailed)	0.160

Since this study utilizes only one independent variable, there is no potential for multicollinearity within the model. A tolerance value of 1 and a VIF value of 1 indicate that the independent variable does not correlate with other independent variables, ensuring the regression model is free from multicollinearity symptoms.

Variable	Sig.	Description
Delivery Speed (X)	0.250	No heteroscedasticity occurred

The results of the heteroscedasticity test show that the significance value of the delivery speed variable is above 0.05, specifically at 0.250. This indicates that there are no symptoms of heteroscedasticity in the model; thus, the residual variance is constant, and the regression model satisfies the classical assumption.

Variable	t	Sig.	Description
(Constant)	3.729	0.000	Significant
Delivery Speed (X)	5.480	0.000	Positive and significant influence

Based on the t-test results in Table 5, the delivery speed variable has a significance value of 0.000, which is smaller than 0.05, with a calculated t-value of 5.480. This indicates that delivery speed has a positive and significant effect on customer trust. Consequently, the research hypothesis stating that delivery speed influences customer trust in e-commerce can be accepted.

Model	F	Sig.	Description
Regression	197.085	0.000	Significant model

The F-test results show a significance value of 0.000, which is smaller than 0.05. This indicates that the regression model as a whole is significant and appropriate for explaining the relationship between delivery speed and customer trust.

R	R Square	Adjusted R Square	Std. Error
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0.944	0.891	0.886	1.98358
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The Adjusted R Square value of 0.886 indicates that 88.6% of the variation in customer trust can be explained by the delivery speed variable. Meanwhile, the remaining 11.4% is influenced by other variables outside the research model. This demonstrates that delivery speed contributes very strongly to shaping customer trust within the context of e-commerce.

Variable	t	Sig.
(Constant)	3.729	0.000
Delivery Speed (X)	5.480	0.000

Based on the simple linear regression analysis, the following model equation is obtained:

$$Y = 4.537 + 0.356X$$

Description:

Y = Customer Trust

X = Delivery Speed

4.537 = Constant

0.356 = Regression Coefficient

The interpretation of the model shows that delivery speed has a positive influence on customer trust. Every unit increase in delivery speed will increase customer trust by 0.356 units, assuming other variables remain constant. These findings confirm that the dimension of speed in service quality acts as a primary determinant in building customer trust, especially in the context of digital transactions characterized by uncertainty and limited direct interaction. Theoretically, these results strengthen the concepts of reliability and responsiveness in service quality as the core foundations for the formation of customer trust within the e-commerce ecosystem.

The results of the descriptive statistical analysis demonstrate that the delivery speed variable, as the independent variable, obtained a total mean value of 25.3858, with all indicators exceeding 3.8. This indicates a positive perception among respondents toward delivery speed performance in e-commerce services, encompassing timeliness, consistency, and the distribution process. Meanwhile, the customer trust variable, as the dependent variable, recorded a mean value of 39.3622, reflecting a relatively strong level of respondent confidence in the reliability of the e-commerce platform. Low standard deviation values for both variables indicate homogeneity in respondent answers and high data consistency. Furthermore, the classical assumption tests were successfully satisfied, where the Kolmogorov-Smirnov normality test yielded a significance value of 0.160 (>0.05), the multicollinearity test showed a tolerance of 1.000 and a VIF of 1.000, and the heteroscedasticity test produced a significance of 0.250 (>0.05); thus, the simple linear regression model is deemed appropriate for use.

Based on the hypothesis testing, the delivery speed variable has a positive and significant effect on customer trust, with a significance value of 0.000 (<0.05) and a t-statistic of 5.480. The simple linear regression model generated the equation $Y = 4.537 + 0.356X$, which implies that every one-unit increase

in delivery speed will increase customer trust by 0.356 units, assuming other variables remain constant. The simultaneous test (F-test) showed a significance value of 0.000, proving that the model is significant overall. The Adjusted R Square value of 0.886 indicates that 88.6% of the variation in customer trust can be explained by delivery speed, while the remaining 11.4% is influenced by other variables outside the model, thereby strengthening the roles of responsiveness and reliability dimensions within service quality as primary determinants of customer trust in the e-commerce ecosystem.

The findings of this study are consistent with previous research indicating that delivery speed is a crucial factor in shaping positive customer perceptions of e-commerce services. Prior research found that increasing delivery speed significantly enhances customer satisfaction and trust by reducing post-purchase uncertainty [41]. Additionally, another study confirmed that timely delivery, as a component of logistics service quality, contributes greatly to the formation of customer trust in quick commerce platforms, particularly among the younger generation who highly value speed [7]. Previous research also affirmed that delivery speed has a positive influence on repurchase intention through the mediation of trust, where fulfilling delivery time promises becomes a key element in reducing the service gap. Similar findings were obtained in an analysis of last-mile delivery, showing that delivery speed and accuracy collectively predict customer loyalty, with a significant contribution from the speed dimension.

Overall, these research findings reinforce empirical evidence that delivery speed, as a vital dimension of service quality, acts as a primary predictor of customer trust on e-commerce platforms. The regression results, showing significant positive coefficients and high variance contribution, align with various prior studies, thereby enriching the theoretical understanding of the causal relationship between delivery speed and customer trust. The practical implications of this study emphasize the importance of logistics optimization for e-commerce players to enhance competitiveness through improved delivery speed and reliability. Furthermore, future research is encouraged to explore other moderating or mediating variables to expand into a more comprehensive model within the context of digital consumer behavior.

IV. CONCLUSIONS

This study aims to analyze the influence of financial Based on the research results, it can be concluded that delivery speed, as a primary dimension of service quality, exerts a positive and significant influence on customer trust within the e-commerce context. The results of the simple linear regression analysis indicate that an increase in delivery speed directly enhances the level of customer trust, as reflected by the positive regression coefficient and high statistical significance. Furthermore, the coefficient of determination, which reached 88.6%, demonstrates that delivery speed provides a highly dominant contribution to explaining the variations in customer trust compared to other factors outside the model. Consequently, delivery speed can be positioned as

a primary determinant in building perceptions of reliability and credibility in e-commerce services.

Theoretically, these findings reinforce the concepts of reliability and responsiveness within the service quality theory as the core foundations for establishing customer trust in a digital transaction environment characterized by uncertainty. Empirically, this study also successfully addresses a literature gap by positioning delivery speed as a standalone independent variable, rather than merely a component of a broader service quality construct. The practical implications of these findings underscore the importance of optimizing logistics systems—particularly regarding timeliness and distribution efficiency—to enhance customer trust. Therefore, e-commerce players and logistics service providers must prioritize delivery speed as a strategic necessity to improve competitiveness and digital business sustainability.

Future research is advised to develop a more comprehensive model by incorporating additional variables, such as customer satisfaction, perceived risk, or customer loyalty, as either mediating or moderating variables. Additionally, utilizing more complex analytical methods, such as Structural Equation Modeling (SEM), could provide a deeper understanding of the relationships between variables within the e-commerce ecosystem. Research could also be expanded to different geographical contexts or specific types of e-commerce platforms to enhance the generalizability of the findings. Finally, longitudinal data collection is recommended to capture the dynamics of changes in customer trust more accurately over a longer period.

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