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SERVICE QUALITY AND DELIVERY SPEED ON CUSTOMER SATISFACTION: THE MODERATING ROLE OF SOCIAL PROOF IN RETAIL REWARD APPLICATIONS

Intan Indah Wahyuningsih[1], Ni Wayan Fitriana Ayu Lestari [2], Mualif Ismail[3]
[1,2,3]Universitas Catur Insan Cendekia, Indonesia
intanwahyuningsih666@gmail.com
Niwayan.lestari@cic.ac.id
mualif.ismail@cic.ac.id
* Coresponding Author

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Abstract

Omnichannel retailers in emerging markets face the challenge of balancing service quality and delivery speed as two key determinants of customer satisfaction, while the moderating role of social proof on both relationships has rarely been tested simultaneously. This study aims to analyze the effect of service quality and delivery speed on the customer satisfaction of omnichannel retail loyalty application users, as well as to examine the moderating role of social proof on both relationships. The study employed a causal-moderation explanatory quantitative design on 170 respondents selected through purposive sampling, analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via a two-stage approach. The results show that service quality (β = 0.244; t = 2.665; p = 0.008) and delivery speed (β = 0.321; t = 4.603; p = 0.000) each have a significant positive effect on customer satisfaction, with delivery speed as the strongest predictor; social proof significantly moderates both relationships but in opposite directions, strengthening the effect of service quality (β = 0.175; p = 0.048) and weakening the effect of delivery speed (β = -0.298; p = 0.004). The novelty of this study lies in the finding of an attribute-dependent dual-moderation effect of social proof on the expectation disconfirmation process, which simultaneously extends Expectancy Disconfirmation Theory and Social Proof Theory. The use of a non-probability sampling method (purposive sampling) constitutes a methodological limitation that restricts the statistical generalization of these findings..

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INTRODUCTION

Indonesia's digital economy has grown very rapidly over the past decade, positioning Indonesia as one of the leading digital markets in Southeast Asia. This wave of digitalization has fundamentally transformed modern retail practices, as card-based loyalty schemes have shifted into mobile application ecosystems that are more adaptive to consumer behavior, enabling consumers to shop online, collect points, access exclusive promotions, and redeem points for physical rewards delivered directly to their address (Soesanto et al., 2023). The operational characteristics of such omnichannel retail loyalty applications generally make service quality and delivery speed two attributes directly experienced by users in every transaction, so that both

attributes become important determinants of customer satisfaction in the digital retail industry.

Table 1. Development of Digital Retail and Alfagift Users in Indonesia

Indicator	Value / Growth	Source
Indonesian internet users (2024)	221.6 million people (79.5% of population)	(Asosiasi Penyelenggara Jasa Internet Indonesia, 2024)
National transaction value of *e-commerce* (2024)	Rp1,288.93 trillion (+17.08% YoY)	(Badan Pusat Statistik, 2025)

Source: Secondary data, processed 2026

Table 1 shows that Indonesia has become one of the gravitational centers of digital growth in Southeast Asia, opening up room for growth for omnichannel retail loyalty applications within the modern retail segment. Nevertheless, the growth of users of physical-delivery-based applications is generally accompanied by public complaints in the digital space, particularly regarding delivery delays that do not match the promised service estimates, service interaction features that have not functioned optimally, and orders received in damaged or incomplete condition. This pattern indicates a gap between consumer expectations and the service actually received, a phenomenon theoretically consistent with Expectancy Disconfirmation Theory (Oliver, 1980).

Customer service quality is a key determinant within the digital retail ecosystem. Utami et al. (2024) confirm that e-service quality plays an important role in increasing customer satisfaction, although their model does not yet incorporate social proof as a moderating variable. Al Firdaus and Rachmawati (2024) examined the effect of e-service quality on user satisfaction in digital banking applications, a context that does not involve physical delivery. On the delivery-speed side, Rashid and Rasheed (2024) found that delivery duration, product condition, and shipping cost are dimensions of logistics quality that significantly affect e-commerce customer satisfaction, while Aljohani (2024) and Sulima (2025) confirm that the match between estimated and actual delivery time is critical for sustaining satisfaction in physical-delivery-based retail models.

Beyond these two direct determinants, digital technology has also changed the way consumers make decisions no longer based solely on personal experience, but increasingly shaped by the experiences of others recorded through reviews, ratings, and testimonials, a phenomenon known as social proof (Cialdini, 1984). Rachmiani et al. (2024) show that the accumulation of positive reviews empirically builds consumer trust toward a product or platform, while Ahn and Lee (2024) show that consumers with an interdependent self-construal a mindset common in collectivist societies such as Indonesia are highly sensitive to ratings and group similarity. Qiu and Zhang (2024) reinforce this finding by showing that the volume, valence, and quality of online review information consistently shape how consumers evaluate service attributes, and Peña-García et al. (2024) found that trust in ratings increases as the number of accumulated reviews grows.

A synthesis of these studies reveals a clear research gap: although studies on service quality and delivery speed on customer satisfaction are already numerous, almost all of them test the two predictors separately, without involving social proof as a dual-moderation variable that operates differently on evaluative-perceptual attributes compared with functional-experiential attributes. This gap becomes even more relevant in light of Park and McCallister (2023) finding that social-proof-based marketing tactics

significantly drive purchase decisions, while Generation Z and millennials who together account for more than half of Indonesia's active internet users are the demographic group most intensively reliant on social information in digital transactions (Asosiasi Penyelenggara Jasa Internet Indonesia, 2024). Expectancy disconfirmation was chosen as the theoretical foundation because this framework has dominated consumer satisfaction research for more than four decades, with recent meta-analytic evidence confirming a consistent positive relationship among expectations, perceived performance, and satisfaction (Schiebler et al., 2026).

The relevance of this gap becomes even stronger when linked to the characteristics of developing markets outside major metropolitan centers. Consumers in metropolitan cities are generally already accustomed to same-day or instant delivery options from various competing platforms, so that delivery speed tends to become a baseline expectation rather than a differentiating factor. In secondary-city markets in developing countries, delivery infrastructure, courier density, and proximity to fulfillment centers are generally relatively less advanced than in major cities, so that delivery-speed performance theoretically has the potential to become a more consequential and more variable driver of satisfaction than in a metropolitan context. Such market characteristics provide a theoretical, not merely geographical, justification for testing the research model outside the context of digitally saturated markets, and became one of the considerations in selecting the data-collection location for this study, as explained in the Method section.

Based on the background, research gap, and theoretical framework above, this study aims to: (1) analyze the effect of customer service quality on customer satisfaction; (2) analyze the effect of delivery speed on customer satisfaction; (3) analyze the moderating role of social proof on the relationship between customer service quality and customer satisfaction; and (4) analyze the moderating role of social proof on the relationship between delivery speed and customer satisfaction.

Theoretical Framework and Hypothesis Development

Customer Service Quality and Customer Satisfaction. In line with Expectancy Disconfirmation Theory (Oliver, 1980) and the e-SERVQUAL framework (Hasan et al., 2024), customers form satisfaction judgments by comparing perceived service performance against previously formed expectations. Responsive, empathetic, and reliable customer service reduces the perceived gap between expectations and experience, and prior research in mobile and e-commerce contexts consistently reports a positive relationship between service quality and satisfaction (Al Firdaus & Rachmawati, 2024; Soeharso, 2024; Zariman et al., 2023). Accordingly:

H1: Customer service quality has a positive and significant effect on customer satisfaction.

Delivery Speed and Customer Satisfaction. Delivery speed is a functional, outcome-oriented performance attribute that is judged directly against the estimated delivery time window communicated at the point of purchase. Logistics-quality research shows that a mismatch between promised and realized delivery time is strongly associated with dissatisfaction, while consistently fast and reliable delivery reinforces positive confirmation (Akil & Ungan, 2022; Jamaludin et al., 2023; Pradana et al., 2024). Accordingly:

H2: Delivery speed has a positive and significant effect on customer satisfaction.

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The moderating role of social proof in this study is argued to be attribute-dependent, operating differently on the two predictor attributes because of their different underlying nature. Customer service quality is largely an evaluative-perceptual attribute, its assessment depends heavily on the interpretation of how "helpful," "responsive," or "competent" an interaction is perceived to be so that this kind of subjective judgment is inherently more susceptible to the influence of external informational cues (Ahn & Lee, 2024; Qiu & Zhang, 2024). When social information (reviews, ratings, testimonials from other users) is available, it functions as an additional interpretive frame for calibrating impressions that are ambiguous or difficult to verify, consistent with the social-proof mechanism under evaluative uncertainty (Cialdini, 1984; Peña-García et al., 2024; Rachmiani et al., 2024). Delivery speed, by contrast, is a time-based functional attribute that customers can verify directly and objectively, whether a package arrives within the promised time window or not. Once customers have obtained a verifiable, direct delivery experience, that experience becomes a stronger and more diagnostic cue of satisfaction than other users' reports, so that reliance on testimonials may be displaced, or may even highlight the mismatch between the promises made in reviews and actual experience, producing an attenuating rather than a reinforcing effect (Caracara-Flores et al., 2025; Harter et al., 2025; Lin et al., 2025).

This logic underlies the argument that social proof exerts a greater reinforcing influence on evaluative-perceptual attributes than on functional-experiential attributes, and the attribute-dependent label is used descriptively both for the hypothesized pattern and, as reported in the Results and Discussion section, for the pattern found rather than being treated as a theoretical law standing apart from empirical evidence.

H3: Social proof positively moderates the effect of customer service quality on customer satisfaction, such that the effect becomes stronger at higher levels of perceived social proof.

H4: Social proof negatively moderates the effect of delivery speed on customer satisfaction, such that the effect becomes weaker at higher levels of perceived social proof.

RESEARCH METHOD

This study employs a causal-moderation explanatory quantitative design, which tests cause-and-effect relationships among variables while also testing whether these relationships change in the presence of a moderating variable (Marzuki et al., 2020; Sekaran & Bougie, 2022). This study is grounded in three theoretical frameworks: Expectancy Disconfirmation Theory (Oliver, 1980), e-SERVQUAL (Hasan et al., 2024), and Social Proof Theory (Cialdini, 1984). The empirical object of this study is users of the Alfagift omnichannel retail loyalty application operated by PT Sumber Alfaria Trijaya Tbk, with data collection conducted in the City and Regency of Cirebon, West Java Province, from February to June 2026, as an empirical representation of a secondary-city market in Indonesia, as argued in the Introduction section.

The study population comprises all Alfagift application users domiciled in the City and Regency of Cirebon, with a population size that is not precisely known. The purposive sampling technique was used as a nonprobability method that requires the researcher to select the most informative and relevant participants (Campbell et al., 2020), with the following inclusion criteria: (1) had transacted or redeemed points at

least three times in the last five months, so that assessments of service quality, delivery speed, and social proof are based on repeated experience rather than a fleeting impression prone to bias; (2) domiciled in the City or Regency of Cirebon; and (3) aged 17–54 years, a range reflecting the productive age group with the highest internet penetration and the greatest maturity in digital decision-making in Indonesia (Asosiasi Penyelenggara Jasa Internet Indonesia, 2023). Referring to Hair et al. (2010), who recommend a PLS-SEM sample size of 5–10 times the number of indicators, this study set a target of 170 respondents. Of the 180 questionnaires collected, 10 responses (5.56%) were eliminated due to a uniform response pattern across all items (straight-lining), leaving 170 valid responses (94.44%) for analysis.

The adequacy of a sample size of 170 respondents for a model with 48 initial indicators needs to be justified more rigorously than by simply applying the 5–10 times the number of indicators ratio. Referring to the 10-times rule recommended by Hair et al. (2022), the more precise benchmark is not the total number of indicators, but the maximum number of structural paths pointing to a single endogenous construct; in this study's model, the Customer Satisfaction (Y) construct receives four paths (from X1, X2, and two moderation interactions), so that the minimum threshold under this rule is 40 respondents, far below the 170 respondents used. As a comparison, an a priori statistical power analysis to detect a medium effect size ($f^2 = 0.15$) at $\alpha = 0.05$ and a power of 0.80 with four predictors generally requires a sample in the range of 85–100 respondents, according to the conventions of multiple regression power analysis (Cohen, 1988). Thus, the sample size of 170 respondents is well above both thresholds, providing adequate statistical justification for the stability of this PLS-SEM model's parameter estimates.

Instrument Development and Respondent Burden

The research instrument consisted of 48 five-point Likert-scale statements measuring three latent constructs namely Customer Service Quality (X1), Delivery Speed (X2), and Social Proof (M), as well as a five-point ordinal scale measuring Customer Satisfaction (Y). The items were adapted from established scales widely referenced in the service quality, logistics, and social proof literature, and were then adjusted to the context of Alfagift application usage.

This study did not involve a pretest or pilot test of the instrument prior to the main data collection, and the researchers acknowledge this as one of the methodological limitations, given that a pretest is generally useful for testing the clarity of each item's wording, estimating completion time, and measuring respondent cognitive burden considerations that are especially important for an instrument as long as the 48 items used in this study. As a post-hoc mitigation for the absence of a pretest stage, the researchers applied two response quality-control steps during the data-cleaning stage: detecting the straight-lining pattern (identical answers across all items) and removing such responses from the dataset before measurement-model analysis was carried out. As an additional check, the questionnaire completion time for the subset of respondents whose data could be verified ranged from 5–6 minutes for 48 items, indicating a reasonable level of engagement rather than a careless response pattern, although completion-time data were not systematically available for all respondents due to limitations of the survey platform, and therefore could not be used as a formal exclusion criterion.

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During the measurement-model evaluation stage, five indicators (X2.1, X2.2, M5, M6, and Y7) were removed from the model because they did not meet the convergent validity criterion (outer loading) or the non-multicollinearity threshold (VIF), so that 43 of the 48 initial indicators were retained for further analysis. Details of the reduction process are presented in Table 2.

Table 2. Details of Indicator Reduction in the Measurement Model Evaluation

Indicator	Construct	Unmet Criterion
X2.1	Delivery Speed (X2)	Convergent validity (outer loading < 0.70)
X2.2	Delivery Speed (X2)	Convergent validity (outer loading < 0.70)
M5	Social Proof (M)	Non-multicollinearity (VIF > 5.00)
M6	Social Proof (M)	Convergent validity (outer loading < 0.70)
Y7	Customer Satisfaction (Y)	Non-multicollinearity (VIF > 5.00)

Source: Initial data processing results, 2026

Table 3. Operationalization Matrix of the Research Instrument

Construct	Dimension	Initial Indicators	Valid Indicators (Final)	Scale Adaptation Source
Customer Service Quality (X1)	System Quality; Information Quality; Service Interaction Quality; Security & Privacy	16	16	(Hasan et al., 2024)
Delivery Speed (X2)	Timeliness; Delivery Accuracy; Delivery Convenience	12	10	(Akil & Ungan, 2022)
Social Proof (M)	Social Influence of Online Reviews; Group Similarity	8	6	(Ahn & Lee, 2024)
Customer Satisfaction (Y)	Overall Satisfaction; Feature Satisfaction; Service Satisfaction	12	11	(Zariman et al., 2023)
Total		48	43	

Source: Adapted from the study's variable operationalization, 2026

Data Analysis Technique

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4, applying a Two-Stage Approach to model the moderation interaction effect. Evaluation of the measurement model (outer model) covered convergent validity (outer loading ≥ 0.70 and Average Variance Extracted/AVE ≥ 0.50), discriminant validity (Heterotrait-Monotrait Ratio/HTMT < 0.90), and construct reliability (Cronbach's Alpha, rho_A, and Composite Reliability ≥ 0.70), referring to Hair et al. (2022) and Henseler et al. (2015). Evaluation of the structural model (inner model) covered multicollinearity (Variance Inflation Factor/VIF < 5), the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2) via the blindfolding procedure, and model fit (Standardized Root Mean Square Residual/SRMR < 0.08). Hypothesis testing used a bootstrapping procedure with 5,000 subsamples at $\alpha = 0.05$, with a hypothesis supported if the t-statistic value ≥ 1.96 and the p-value < 0.05 (Hair et al., 2022).

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Common Method Bias Assessment

In addition to the VIF test to detect multicollinearity among exogenous variables in the structural model, this study also conducted a *full collinearity* test to assess the risk of *common method bias* (CMB), given that all constructs were measured using self-report instruments at a single point in time. Unlike the earlier VIF test, which assesses collinearity among predictors within the same structural equation, this test regresses each construct's score against all other constructs in the model simultaneously. A *full collinearity* VIF value below 3.3 is interpreted as evidence that the model is not substantially contaminated by common method bias (Hair et al., 2022), referring to the approach of Kock (2015). The full collinearity VIF approach was chosen over Harman's Single Factor test because the latter requires exploratory factor analysis of individual indicator scores, a procedure that is not aligned with the composite-score-based estimation logic of PLS-SEM, so that full collinearity VIF is more strongly recommended as a CMB diagnostic test in the PLS-SEM context (Kock, 2021).

RESULTS AND DISCUSSION

Respondent Profile

The characteristics of the 170 study respondents are presented in Table 4, covering domicile, gender, age group, and transaction frequency over the last five months.

Table 4. Characteristics of Study Respondents

Characteristic	Category	Percentage
Domicile	Kota Cirebon	68.82%
	Kabupaten Cirebon	31.18%
Gender	Perempuan	69.41%
	Laki-laki	30.59%
Age	17 - 25 years	63.53%
	26 - 35 years	28.24%
	36 - 45 years	5.88%
	46 - 54 years	2.35%
Transaction frequency / 5 months	3 times	68.24%
	3 - 5 times	6.47%
	> 5 times	25.88%

Source: Primary data processed, 2026 (n = 170)

Table 4 shows that the majority of respondents are domiciled in the City of Cirebon, female, and belong to the young productive age group (17 - 35 years), which together comprises more than 90% of respondents. The dominance of the young age group is consistent with their characteristics as *digital native*s, who are more accustomed to operating online shopping applications, while the dominance of female respondents reflects women's role as the primary decision-maker in household shopping. In terms of transaction frequency, the majority of respondents (68.24%) transacted three times in the last five months, while 25.88% were classified as loyal users with a transaction frequency of more than five times, indicating the presence of a user segment that consistently makes use of the Alfagift application.

Measurement Model Evaluation (Outer Model)

The measurement model evaluation resulted in the reduction of five indicators (X2.1, X2.2, M5, M6, and Y7) as explained in Table 2, so that 43 of the 48 initial

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indicators were retained for further analysis. A summary of the validity and reliability test results for each construct is presented in Table 5.

Table 5. Summary of Validity and Reliability Test Results

Construct	Valid Indicators	*Outer Loading*	AVE	*Cronbach's Alpha*	*Composite Reliability*
Customer Service Quality (X1)	16	0.704 - 0.787	0.617	0.949	0.954
Delivery Speed (X2)	10	0.738 - 0.824	0.601	0.931	0.941
Social Proof (M)	6	0.773 - 0.833	0.642	0.888	0.915
Customer Satisfaction (Y)	11	0.753 - 0.811	0.567	0.934	0.943

Source: Data processed with SmartPLS 4, 2026

Table 5 shows that all *outer loading* values are above 0.70 and the AVE values of all constructs exceed 0.50, so that the convergent validity of the measurement model is satisfied according to the criteria (Hair et al., 2022). The *Cronbach's Alpha* and *Composite Reliability* values of all constructs also exceed the 0.70 threshold, indicating very good internal consistency of the indicators. Discriminant validity, as tested through the *Heterotrait-Monotrait Ratio* (HTMT), yields values ranging from 0.817–0.878, all of which are below the 0.90 threshold (Henseler et al., 2015), so that each construct is empirically proven to be distinct from the others, although some values approach the stricter criterion (0.85). With all validity and reliability criteria satisfied, the measurement model is declared adequate to proceed to the structural model analysis stage.

Structural Model Evaluation (Inner Model)

The results of the structural model evaluation cover the multicollinearity test, model fit, coefficient of determination, and predictive relevance, as summarized in Table 6.

Table 6. Structural Model Test Results

Criterion	Value	Threshold
Indicator VIF (multicollinearity)	2.169 - 4.445	< 5.00
SRMR (*model fit*, *estimated model*)	0.064	< 0.08
R^2 Customer Satisfaction (Y)	0.795 (*adjusted* 0.788)	> 0.75 = strong
Q^2 Customer Satisfaction (Y)	0.466	> 0.35 = large

Source: Data processed with SmartPLS 4, 2026

Table 6 shows that all indicator VIF values are below the conservative threshold of 5, including the two moderation interaction variables, each of which has a value of 1.000 because they were formed through orthogonalized latent scores under the Two-Stage approach (Hair et al., 2022), so that the model is free from serious multicollinearity problems. The SRMR value of 0.064 is below the 0.08 threshold (Henseler et al., 2015), indicating good model fit with the empirical data. The structural model is able to explain 79.5% of the variance in customer satisfaction (R^2 = 0.795), classified as strong according to the criteria (Hair et al., 2022), with large predictive relevance (Q^2 = 0.466), so that this research model is adequate for explaining and predicting the customer satisfaction of Alfagift users in Cirebon.

Common Method Bias Assessment

Table 7. *full collinearity* VIF Values

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Construct	Full Collinearity VIF
X1	3.60
X2	4.20
M	4.52
Y	4.69

Source: Data processed, 2026

All full collinearity VIF values are above the conservative threshold of 3.3 (Hair et al., 2022; Kock, 2015), with the highest values found in construct Y (VIF = 4.69) and M (VIF = 4.52). This condition warrants critical examination rather than merely being noted as a formal limitation, because the highest VIF values are concentrated precisely in the dependent variable (Y) and the moderator (M) two constructs that directly shape the results of the H3 and H4 moderation hypothesis tests. The high VIF for M opens up the possibility that part of the shared variance between the social proof measurement and other constructs stems from a single-instrument response pattern (common source variance), rather than being purely a genuine conceptual relationship; if so, the reported strength of the social proof moderation effect could be artificially inflated. Likewise, the highest VIF for Y increases the risk that part of the variance explained by the model (R^2 = 0.795) also reflects a shared measurement source rather than a purely genuine structural relationship, so that the strength of the relationships in H1 and H2 should be interpreted with proportionate caution. These values do indeed remain below the alternative threshold of 5.0 that applies to factor-based algorithms (Kock & Lynn, 2012), but that threshold does not eliminate the risk of bias specifically in constructs Y and M. A number of procedural mitigation steps were applied during the data-collection stage, including guaranteeing respondent anonymity, separating the placement of predictor and criterion items in the questionnaire, and using varied response scales; the relatively high inter-construct correlations (r = 0.77–0.83) were also tested through HTMT-based discriminant validity, although these procedural mitigations do not fully eliminate the bias risk indicated for Y and M, and this is therefore explicitly reported as a limitation of the study at the end of this manuscript.

Hypothesis Testing

Hypothesis testing was carried out through a *bootstrapping* procedure with 5,000 *subsamples* in a *two-tailed test*, α = 0.05. The results of testing the four hypotheses are presented in Table 8.

Table 8. Hypothesis Test Results

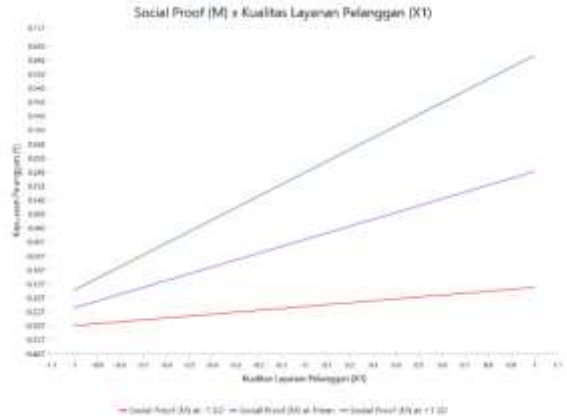
Relationship Path	Coefficient	*t-statistic*	*p-value*	Decision
H1: Customer Service Quality (X1) → Customer Satisfaction (Y)	0.244	2.665	0.008	Supported
H2: Delivery Speed (X2) → Customer Satisfaction (Y)	0.321	4.603	0.000	Supported
H3: *Social Proof* × X1 → Customer Satisfaction (Y)	0.175	1.982	0.048	Supported
H4: *Social Proof* × X2 → Customer Satisfaction (Y)	-0.298	2.872	0.004	Supported

Source: Data processed with SmartPLS 4, 2026

Table 8 shows that all four research hypotheses are supported, as all *t-statistic* values exceed 1.96 and p-values are below 0.05. Customer service quality (X1) has a significant positive effect on customer satisfaction (H1: β = 0.244), consistent with Zariman et al. (2023) in the *mobile commerce* context, as well as Al Firdaus and Rachmawati (2024) and Soeharso (2024) in the Indonesian e-commerce context. Delivery speed (X2) is the strongest predictor in the model (H2: β = 0.321; t = 4.603), consistent with Akil and Ungan (2022), Jamaludin et al. (2023), and Pradana et al. (2024) although it differs from the findings of Chotisarn and Phuthong (2025) in the *cross-border e-commerce* context, which has different delivery-time expectations.

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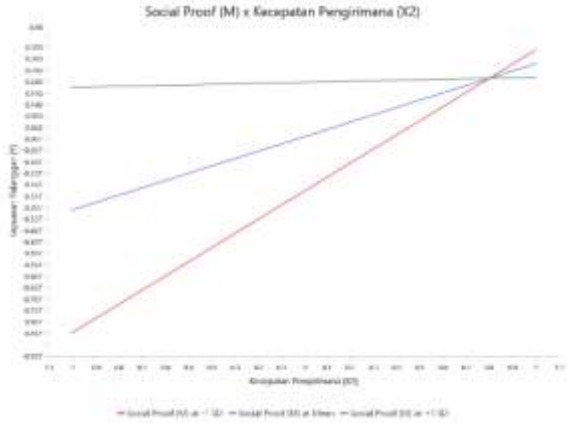
Simple Slope Analysis



Source: Data Processed with SmartPLS 4, 2026

Figure 1. *Simple Slop Analysis Social Proof* and Customer Service Quality

For H3, the interaction between social proof and customer service quality produces a positive coefficient (β = 0.175), indicating that reviews and ratings from other users strengthen the effect of service quality on satisfaction. At high levels of social proof, the slope (gradient) of the service quality, satisfaction relationship is steeper than at low levels of social proof, as shown in Figure 1; mathematically, the interaction coefficient β = 0.175 represents the difference in gradient between the high (+1 SD) and low (-1 SD) social proof conditions on that simple regression line. This pattern is consistent with (Ahn & Lee, 2024; Qiu & Zhang, 2024; Rachmiani et al., 2024), although it differs from Salameh et al. (2022) and Al-Mu'ani et al. (2024), who did not find a significant moderation effect on platforms that already had a high level of trust.



Source: Data Processed with SmartPLS 4, 2026

Figure 2. Simple Slop Analysis Social Proof and Delivery Speed

For H4, the interaction between social proof and delivery speed produces a negative coefficient (β = -0.298), indicating that social proof weakens the relationship between delivery speed and satisfaction. The gradient of the delivery speed–satisfaction relationship becomes flatter at high levels of social proof than at low levels of social proof, consistent with an attenuating effect rather than a reversal of the relationship's direction (the direction of the relationship remains positive under both moderator conditions; only its strength decreases), as shown in Figure 2. This pattern is consistent with (Caracara-Flores et al., 2025; Harter et al., 2025; Lin et al., 2025; Sulima, 2025).

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DISCUSSION

Customer service quality is empirically shown to be a positive and significant predictor of customer satisfaction (β = 0.244; p = 0.008), supporting H1. Psychologically, this finding is consistent with the mechanism of Expectancy Disconfirmation Theory: responsive and reliable service interactions reduce the perceived gap between expectations and experience, while also functioning as a risk-reducing heuristic that increases customer trust in the platform when facing the uncertainty of digital transactions. This finding is consistent with (Al Firdaus & Rachmawati, 2024; Soeharso, 2024; Zariman et al., 2023) in other Indonesian mobile and e-commerce contexts. Within the Alfagift user base in Cirebon, this shows that even in a secondary-city market where digital retail competition is not as intense as in metropolitan areas, the quality of service interactions remains a meaningful driver of satisfaction, rather than an attribute that customers simply take for granted.

Delivery speed emerges as the strongest predictor in the model (β = 0.321; p = 0.000), supporting H2 and consistent with (Akil & Ungan, 2022; Jamaludin et al., 2023; Pradana et al., 2024). The dominance of delivery speed over service quality can be explained by the difference in the diagnostic nature of the two attributes: as a functional attribute that can be objectively verified (a package arrives on time or not), delivery speed provides a less ambiguous satisfaction signal than the more interpretive assessment of service quality, so that customers tend to place greater weight on concretely verified failures or successes than on more subjective service impressions a pattern consistent with the principle that negative disconfirmation of an explicit, measurable promise (delivery time) produces a sharper psychological impact than disconfirmation of a vaguer expectation (Oliver, 1980; Wang et al., 2025). This result is also consistent with the secondary-city rationale argued in the Introduction: because delivery infrastructure is relatively less advanced than in Indonesia's major cities, delivery-time performance is likely to carry greater weight as a driver of satisfaction because of its more variable and more diagnostic nature with respect to the underlying service capacity. This finding differs from Chotisarn and Phuthong (2025), whose respondents in a cross-border e-commerce context had different baseline delivery-time expectations, confirming that the effect of delivery speed is contextual rather than universal.

Social proof significantly strengthens the effect of customer service quality on satisfaction (β = 0.175; p = 0.048), supporting H3. Service quality is a relatively evaluative-perceptual attribute, leaving room for social information to shape the interpretation of ambiguous service interactions. This finding is consistent with (Ahn & Lee, 2024; Qiu & Zhang, 2024; Rachmiani et al., 2024), although it differs from (Al-Mu'ani et al., 2024; Salameh et al., 2022), whose null moderation finding occurred on platforms that already had a very high baseline level of trust, a boundary condition worth examining rather than dismissing, given that Alfagift, as a brand affiliated with the already well-established Alfamart, should theoretically exhibit a similarly weak effect pattern; the fact that this did not occur indicates that brand trust alone has not fully replaced the calibrating function that reviews provide for evaluative service attributes.

Social proof significantly weakens the effect of delivery speed on satisfaction (β= -0.298; p = 0.004), supporting H4, and represents the most theoretically consequential finding of this study, as it runs counter to the general assumption in Social Proof Theory (Cialdini, 1984) that social information uniformly reinforces judgments. Consistent with

the attribute-dependent logic, delivery speed is a directly verifiable functional attribute: once customers have their own delivery experience, that experience appears to dominate other users' reports, so that reliance on social information weakens rather than strengthens. This finding is consistent with (Caracara-Flores et al., 2025; Harter et al., 2025; Lin et al., 2025; Sulima, 2025). In the Cirebon context, this shows that no matter how many positive delivery reviews exist, they cannot substitute for consistent, verified delivery performance customers who personally experience delivery delays will not feel satisfied simply because other users report fast delivery.

The attenuating effect found in H4 can be further explained through an expectation-inflation mechanism originating from the positive reviews themselves. In line with Expectancy Disconfirmation Theory (Oliver, 1980), consistently positive delivery reviews and ratings can raise the customer's reference point for delivery-speed expectations before transacting, thereby raising the standard that actual delivery performance must meet; when the perceived delivery experience does not fully meet these inflated expectations, even for relatively minor delays, the gap between expectation and performance can still produce negative disconfirmation (Harter et al., 2025). This condition is consistent with Cognitive Dissonance Theory (Festinger, 1957), which has been integrated with expectation disconfirmation by Wang et al. (2025): the mismatch between the expectations shaped by reviews and the actual delivery experience creates psychological discomfort (dissonance), which customers then reduce by lowering their satisfaction rating, rather than by blaming the reviews that shaped those expectations. In other words, for a functional attribute such as delivery speed, positive reviews do not merely lose their reinforcing power once a direct experience occurs, but actively increase the risk of negative disconfirmation by setting a higher performance benchmark.

Overall, these results indicate that the role of social proof in this study is conditional: strengthening the relationship for more evaluative-perceptual attributes such as service quality, while weakening the relationship for more experiential-functional attributes such as delivery speed. This finding fills the research gap identified in the Introduction, while also showing that the general assumption that social proof (Cialdini, 1984) is always reinforcing does not fully hold within retail loyalty application ecosystems that already have an established brand-trust base. Theoretically, this study strengthens the relevance of Expectancy Disconfirmation Theory and e-SERVQUAL in the Indonesian mobile commerce context, while also extending Social Proof Theory by demonstrating the dual nature of its role as a moderator.

THEORETICAL IMPLICATIONS

This study extends Expectancy Disconfirmation Theory and e-SERVQUAL to the mobile commerce context in secondary-city markets in developing countries, an empirical setting that remains underrepresented in the literature compared with metropolitan markets. More substantively, this study extends Social Proof Theory by showing that the moderating function of social information is not uniform across all service attributes: social information can simultaneously strengthen one relationship and weaken another within the same model, depending on whether the attribute in question is evaluative-perceptual or functional-experiential. Future development of social proof theory in service contexts needs to specify the type of attribute being moderated, rather than treating the direction of social proof moderation as a fixed property of the construct itself.

Managerial Implications

The following are several managerial implications for Alfagift's management:

1) Complaint handling and service responsiveness. Because H1 confirms that service quality drives satisfaction, the company needs to prioritize measurable service responsiveness targets and monitor them as an operational KPI, given that the effect of service quality operates independently while also being reinforced by social proof.
2) Monitoring and consistency of delivery time. Given the H2 finding that delivery speed is the strongest predictor, and the H4 finding that social proof cannot compensate for a poor delivery experience, the company needs to prioritize operational investment in delivery-time consistency and the accuracy of delivery-window estimates, rather than investment in delivery-related marketing claims.
3) Differentiated management of reviews and social proof. Because social proof strengthens satisfaction through perceived service quality (H3) but cannot substitute for actual delivery performance (H4), the company needs to prioritize collecting and displaying user reviews related to service interactions (e.g., staff friendliness, complaint resolution), while avoiding marketing messages that frame reviews as a guarantee of delivery speed.
4) Utilization of customer feedback. The company needs to build a structured process for channeling review content related to service quality back into front-line training and store-level service improvement, given the proven link between perceived service quality and satisfaction.

CONCLUSION

This study concludes that customer service quality and delivery speed are two important determinants of customer satisfaction within the omnichannel retail ecosystem, with delivery speed consistently acting as the more dominant predictor compared with service quality. This finding answers the research question that functional performance directly verifiable by customers tends to carry greater weight in satisfaction judgments than evaluative-perceptual attributes, particularly in the context of developing markets with still-developing logistics infrastructure.

This study's main theoretical contribution lies in demonstrating that the moderating role of social proof is attribute-dependent, rather than uniform as generally assumed in Social Proof Theory: social proof strengthens the relationship for evaluative-perceptual attributes (service quality), but weakens the relationship for directly verifiable functional-experiential attributes (delivery speed). This dual-moderation effect finding simultaneously extends Expectancy Disconfirmation Theory and Social Proof Theory, and confirms that the role of social information in shaping digital customer satisfaction needs to be understood conditionally, depending on the characteristics of the attribute being assessed, rather than as a universally reinforcing force.

Research Limitations

This study has a number of limitations, as follows:

1) The use of nonprobability purposive sampling, which limits statistical generalization beyond the sample population and user groups with similar characteristics.

2) A cross-sectional design, which captures perceptions of service quality, delivery speed, social proof, and satisfaction at a single point in time, and therefore cannot explain how these perceptions develop with continued use.
3) A single geographical context (the City and Regency of Cirebon), which, although theoretically justified as representative of a secondary-city market, means that the specific coefficients reported here should not be assumed to generalize to other secondary cities without further testing.
4) An indication of common method bias in constructs Y and M, as shown by full collinearity VIF values above the 3.3 threshold, which could potentially affect the strength of the relationships reported for H1 through H4, despite a number of procedural mitigation steps having been applied.

Suggestions For Future Research

Future research needs to test whether the social proof dual-moderation pattern found in this study strengthening the effect of service quality while weakening the effect of delivery speed holds generally in other secondary cities, or merely reflects the unique characteristics of the Cirebon market. Variables such as brand trust and prior user experience are also worth including, given that both have the potential to shape customer satisfaction beyond the role of social proof. In addition, future research could involve technological variables that directly shape the experience of service quality and delivery speed, such as User Experience (UX) application interface design and the implementation of algorithmic dispatching for courier assignment and delivery route optimization, given that both technological factors have been shown to contribute to the efficiency and consistency of delivery performance in artificial-intelligence-based last-mile delivery research (Kasoju et al., 2025). Regarding the limitation of the cross-sectional design, testing of the attenuating mechanism in H4 would be more convincing if conducted longitudinally, for example through three measurement points: immediately after initial adoption, around three months of use, and within a range of six to twelve months. This range does not derive from the data-processing results, but is a proposal aligned with this study's respondent criteria, namely a minimum of three transactions within five months, making it a reasonable starting point for the design of follow-up research. With this approach, future research could more definitively clarify the direction of causality and how the role of social proof changes over the course of customer usage.

Statement on the Use of Artificial Intelligence.

AI was used in the preparation of this manuscript. The authors used artificial intelligence tools solely to assist with language improvement, grammar checking, and editing for clarity and readability. The authors remain fully responsible for the accuracy, originality, integrity, and academic content of the manuscript. All AI-assisted content was reviewed and verified by the authors before submission.

Conflicts of Interest

The authors declare that there is no conflict of interest in the conduct of this research and the publication of this article.

Author Contributions

Conceptualization, IIW, NWFAL, and MI; data collection, IIW; data validation, NWFAL and MI; data processing and analysis, IIW; writing original draft preparation, IIW;

writing review and editing, NWFAL and MI; supervision, NWFAL and MI. All authors have read and approved the final version of the manuscript.

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