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The Interplay of Promotional Strategies and Service Quality in Fostering Customer Loyalty: An Empirical Study of Indonesia's E-Commerce Duopoly of Tokopedia vs. Shopee

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ABSTRACT

E-commerce plays a central role in Indonesia's digital economy, with Tokopedia and Shopee forming a dominant duopoly that shapes user behaviour. Despite rapid sector growth and heavy reliance on price-based promotions, the long-term sustainability of customer loyalty remains unclear. Existing research largely isolates promotional strategies or service-quality antecedents, yet rarely examines their interaction within an emerging-market context where consumers are highly price-sensitive but increasingly expect advanced digital service experiences. This study addresses this gap by empirically analyzing the interplay between Perceived Promotional Attractiveness (PPA), E-Service Quality (ESQ), Customer Satisfaction (CS), and Customer Loyalty (CL) across both platforms. A quantitative-explanatory design was employed by surveying active Shopee and Tokopedia users in the Jakarta Metropolitan Area. Twenty-four indicators across four constructs (PPA, ESQ, CS, CL) were assessed using PLS-SEM, supported by bootstrapping, mediation analysis, predictive evaluation, and multi-group comparison. Findings show that ESQ is the strongest and most consistent predictor of CS on both platforms (Tokopedia $\beta = 0.894$; Shopee $\beta = 0.759$, $p < 0.001$). Responsiveness, problem resolution, transactional security, and delivery reliability emerged as the most critical dimensions. CS significantly predicted CL, particularly on Shopee. Conversely, PPA had minimal—and in Tokopedia's case, slightly negative—effects on CS and CL, suggesting promotions have become hygiene factors rather than differentiators. Overall, the study concludes that service quality—not promotional intensity—is the primary driver of sustainable customer loyalty in Indonesia's e-commerce duopoly. Strengthening secure transactions, responsive support, reliable fulfillment, and high-quality user experience is essential for long-term competitive advantage.

KEYWORDS Customer Loyalty; Customer Satisfaction; E-Commerce Duopoly; E-Service Quality; Gamification Live Commerce.

INTRODUCTION

The digital economy of Indonesia is a very dynamic and rapidly developing market. Taking the recent survey of the industry, the entire market size is projected to reach approximately $109 billion dollars in 2025, with e-commerce comprising the largest segment of approximately $82 billion dollars during the same year (Bain and Company, 2023). These figures indicate that Indonesia is rapidly emerging as the digital-commerce hub in Southeast Asia, particularly due to its youthfulness and technological-based generation and the online shopping spurt following the pandemic.

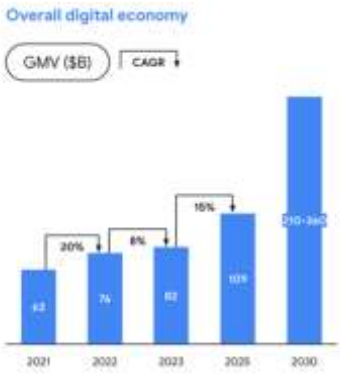

Figure 1 Gross Merchandise Value of Indonesia

The two names Tokopedia and Shopee are at the center of this e-commerce boom that every Indonesian spends time on. They are fighting over the attraction of smarter and more discerning online shoppers (Mardiani et al., 2023, 131). Shopee is currently leading in gross merchandise value, brand presence, and transaction volume, whereas Tokopedia is hitting a solid second place in key performance indicators (Rizaty, 2025).

Figure 2 Indonesia E-commerce Market Share

Their competition is a standard duopoly battle: both platforms colonize the same users, and only by taking a quick glance at their web quality does the difference between Tokopedia and Shopee emerge, revealing nearly the same user experience (WQI scores of 0.844 and 0.840, respectively; Hernando et al., 2022). However, when you trace their marketing strategies, actual variations become apparent. The competitive advantage of Shopee is principally based on its product and pricing policies, whereas Tokopedia is well-positioned in its promotion and distribution channels (Uva et al., 2024). According to the game-theory approach, both are heavily dependent on promotions, but Tokopedia focuses on security, price, and quick delivery, whereas Shopee emphasizes store completeness, design, and safety (Amelia et al., 2023). The heavy advertising by Shopee has, and continues to, provide an edge in popularity from 2020 to 2023 when considering the hard numbers. This is supported by digital analytics: Shopee has 57% overall reach and 56% brand mentions, a narrow but significant difference when each platform has more than 120 million users per month (Barus, 2024). Cheap promotions and celebrity-driven campaigns dominate the current competition, indicating that the crown of e-commerce leadership is determined not only by technology but also by marketing savvy (Pitriani et al., 2024).

Critical research gaps persist in understanding how promotional strategies interact with sustainable loyalty drivers within emerging market duopolies. First, research has mainly examined individual drivers of loyalty without analyzing their interaction in a highly competitive environment (Baumann et al. 2017; Rather et al. 2019). Second, long-term research on distinctive Indonesian promo strategies—gamification, live selling, and AI personalization—and their effect on sustainable loyalty is yet to be conducted (Bahri et al. 2026; Halim et al. 2025; Lim et al. 2025). Third, Indonesia is a bargain-hunting nation with consumers who are rapidly becoming more digital, highly price-sensitive, and deal-oriented; thus, studies specific to these tangible consumer characteristics are needed rather than generalized theories.

This study addresses those gaps by focusing on Tokopedia and Shopee to understand how temporary promotions interact with sustainable loyalty factors such as service quality, trust in the platform, and overall user experience. The aim is to strike the right balance between money spent attracting new users and money invested in retaining them, providing academics and marketers with a solid framework to succeed in a competitive market where conditions evolve rapidly (Davenport et al. 2017; Flannery 2021; Hyder 2016; Kumar et al. 2018; Massy 2016).

Indonesia's e-commerce market is one of the largest globally, valued at USD 90.35 billion in 2025 and projected to reach USD 185.71 billion by 2030. Shopee and Tokopedia dominate the sector with a combined market share exceeding 70%, competing intensely through aggressive promotional strategies such as flash sales, gamified shopping, and large-scale discount campaigns. However, heavy reliance on short-term incentives raises concerns about their effectiveness in building sustainable customer loyalty. Indonesian consumers are highly price-sensitive and tend to switch platforms in search of better deals, making loyalty fragile and unstable (Rimadini et al. 2025; Sihombing 2026; Wicaksono 2025).

Existing studies show that while promotions can influence purchase decisions, their long-term impact on loyalty is limited and often indirect, depending on mediating factors such as customer satisfaction, hedonic value, and utilitarian value. Gamification exhibits mixed effects—sometimes boosting repurchase intention through positive emotions, but in other contexts only increasing platform usage without directly strengthening loyalty. These findings highlight that promotions are effective only when integrated into a satisfying and meaningful user experience.

In contrast, strong empirical evidence consistently shows that e-service quality—particularly transaction security, system reliability, responsiveness, and customer support—is a far more powerful driver of satisfaction and long-term loyalty. Both platforms currently experience low loyalty because their features and incentives are similar, resulting in weak differentiation despite high user activity levels. The core strategic problem lies in the gap between frequent platform use and low willingness to repurchase consistently. Therefore, sustainable loyalty in Indonesia's e-commerce duopoly must be built on service excellence and trust rather than temporary promotional stimuli.

This study examines the mechanisms through which promotions and service quality shape customer satisfaction and loyalty in Indonesia's e-commerce duopoly. Specifically, the research seeks to determine the extent to which Perceived Promotional Attractiveness (PPA) and E-Service Quality (ESQ) positively influence Customer Satisfaction (CS), and whether CS

in turn drives Customer Loyalty (CL). It also investigates whether PPA and ESQ have significant indirect effects on CL through CS. Correspondingly, the study aims to empirically test and quantify the impacts of PPA and ESQ on CS, assess the effect size of CS on CL, and evaluate the mediating role of CS in linking PPA and ESQ to CL. Mediation is examined through the estimation of indirect and total effects alongside their confidence intervals.

This research focuses on understanding the drivers of customer loyalty on Tokopedia and Shopee using Jakarta as the study setting. Jakarta serves as Indonesia's most advanced e-commerce hub, accounting for more than 40% of national online transactions and representing the highest concentration of digitally mature consumers. This urban environment provides a suitable microcosm for examining how promotional strategies, service quality, trust, and user experience influence loyalty in a highly competitive market. The insights gained are expected to reflect behavioral patterns that can guide loyalty strategies in other developing urban centers across Indonesia.

Despite its strengths, the study is limited by its concentration on the Jakarta metropolitan area. The behaviors and expectations of Jakarta's highly digital, urban consumers may differ substantially from users in rural or less developed regions, where digital access, trust perceptions, and shopping habits vary widely. Therefore, the findings should not be generalized to the entire Indonesian market without caution. Additionally, reliance on self-reported survey data introduces potential recall and social desirability biases. Given the rapidly evolving nature of the e-commerce landscape, future changes in market dynamics may also affect the long-term applicability of the conclusions.

METHOD

This study adopted a quantitative–explanatory design using survey data analyzed through Partial Least Squares–Structural Equation Modeling (PLS-SEM). The research process began by identifying the central business problem and converting it into testable hypotheses concerning the influence of Perceived Promotional Attractiveness (PPA) and E-Service Quality (ESQ) on Customer Satisfaction (CS), and the subsequent effect of CS on Customer Loyalty (CL), including possible mediation. A comprehensive literature review established the theoretical framework, measurement constructs, and research gaps. PPA was modeled as a higher-order construct consisting of gamification, financial incentives, and live commerce, while ESQ comprised website design, customer service, security, and fulfillment quality. A structured questionnaire using a 7-point Likert scale was developed and pilot-tested with 30 respondents to ensure item clarity and content validity, with reliability thresholds set at $\alpha/CR \geq 0.85$. The target population included active Shopee and Tokopedia users in Jakarta who had made at least two purchases in the previous six months. Survey links were distributed through social media and university networks, with a minimum sample target of 300 respondents. Data were screened for duplicates, straight-line responses, missing values, and common method bias before further analysis.

PLS-SEM analysis followed a two-phase approach. The measurement model was assessed using outer loadings (≥ 0.70), Cronbach's alpha and composite reliability (≥ 0.85), AVE (≥ 0.50), and discriminant validity (HTMT < 0.85 and Fornell–Larcker criteria). Indicators with loadings between 0.40–0.70 were retained only when their constructs met reliability and validity standards. After validating the measurement model, the structural model

was examined using path coefficients, 5,000-bootstrap significance testing (95% CI), R^2, f^2, Q^2, and SRMR. Mediation effects were estimated by analyzing indirect, direct, and total effects to determine whether CS partially or fully mediated the influence of PPA and ESQ on CL. Since each respondent evaluated both platforms, a multi-group analysis (MGA) was conducted using MICOM and PLS-MGA to compare path strengths across Shopee and Tokopedia. Predictive validity was evaluated using PLSpredict with k-fold cross-validation by comparing RMSE and MAE values against a linear benchmark model. Robustness checks included sensitivity tests for discriminant validity (HTMT 0.90 threshold), re-estimation after dropping borderline indicators, and comparison of two alternative higher-order construct modeling approaches. All results were finally synthesized to provide managerial insights, linking statistical findings back to the original business problem concerning loyalty formation in Indonesia's e-commerce duopoly.

RESULT AND DISCUSSION

Measurement Model Evaluation

To determine the validity and reliability of the constructs used in the current study, the measurement model (outer model) was evaluated. The process is in line with the requirements outlined in Chapter 3 including internal consistency assessment, the convergent validity and the discriminant validity.

(a) Indicator elimination process

Table 1 Initial Cronbach's Alpha

Initial Cronbach's Alpha	
	Cronbach's Alpha
PA	0.828
ESQ	0.889
CS	0.925
AL	0.853
BL	0.881

Table 1 shows the first instance of the internal reliability of each of the constructs before the process of purification of the indicators. In the PLS-SEM literature, a Cronbach's alpha of ≥ 0.70 is considered sufficient, and ≥ 0.85 is excellent to represent an instrument that is ready to be subjected to structural analysis. It is quite impressive that the original Cronbach's Alpha values are already impressive which means that the internal consistency of the items associated with each construct was already solid even before any of the indicators were removed. Practically, this result implies that the respondents were always consistent in the way they responded to the questions that were related to a specific construct.

Table 2 Initial Outer Loadings

Initial Outer Loadings					
	PA	ESQ	CS	AL	BL
PA_G1	0.835				
PA_G2	0.813				
PA_F1	0.64				

PA_F2	0.498				
PA_L1	0.801				
PA_L2	0.78				
ESQ_W1		0.633			
ESQ_W2		0.67			
ESQ_C1		0.8			
ESQ_C2		0.825			
ESQ_S1		0.796			
ESQ_S2		0.776			
ESQ_F1		0.678			
ESQ_F2		0.755			
CS1			0.892		
CS2			0.91		
CS3			0.928		
CS4			0.891		
AL1				0.888	
AL2				0.889	
AL3				0.867	
BL1					0.905
BL2					0.918
BL3					0.88

Table 2 shows the indicator loadings prior to purification, where several items fell below the 0.70 threshold—PA_F1 (0.64), PA_F2 (0.498), ESQ_W1 (0.633), ESQ_W2 (0.67), and ESQ_F1 (0.678). These low loadings indicate that the items contribute weakly to their constructs. For PPA, discounts/vouchers and free shipping have become hygiene factors in Indonesia's e-commerce market, offering little differentiation and therefore generating low variability in responses. For ESQ, weak loadings on website design and timeliness suggest that both platforms are perceived as similarly adequate in design features and that shipping speed is influenced by external parties such as couriers or sellers, making users less likely to attribute this aspect directly to platform service quality.

Table 3 Final Outer Loadings

Final Outer Loadings					
	PA	ESQ	CS	AL	BL
PA_G1	0.888				
PA_G2	0.866				
PA_F1					
PA_F2					
PA_L1	0.823				
PA_L2	0.782				
ESQ_W1					
ESQ_W2					
ESQ_C1		0.869			
ESQ_C2		0.872			
ESQ_S1		0.776			
ESQ_S2		0.823			
ESQ_F1					

ESQ_F2	0.748			
CS1		0.892		
CS2		0.91		
CS3		0.928		
CS4		0.891		
AL1			0.888	
AL2			0.889	
AL3			0.867	
BL1				0.905
BL2				0.918
BL3				0.88

Table 3 (Final Outer Loadings) shows the indicator loadings after the elimination process. On the residual indicators, this time, the readings are strong i.e., it has a load over 0.70, e.g., PA_G1 = 0.888; PA_G2 = 0.866; ESQ_C1 = 0.869; ESQ_C2 = 0.872; CS3 = 0.928; BL2 = 0.918. The values can be said to be satisfactory and show that the retained items are a good representation of their respective constructs. The identified pattern brings valuable information: the customer service dimension, including the dimensions of responsiveness and encompassing the problem solving, and the security dimension, including the sense of safety and data protection, are the most relevant aspects of the ESQ construct to respondents, and, in terms of promotional features, gamification and live commerce are viewed as more conspicuous and attractive than discounts or free shipping.

(b) Reliability and Validity

Once the process of elimination had been done, the final model of measurement was revisited. As the outcomes in Table IV.3 shows, all the criteria of reliability and convergent validity are met. Table IV.4, which is titled Internal Reliabilities and Convergent Validity, summarizes the values of Cronbach, alpha, composite reliability (CR), and average variance extracted (AVE) after elimination. The high levels used in the analysis of this paper are alpha and CR ≥ 0.85 and AVE ≥ 0.50. All the constructs exceed these standards particularly the ESQ scale is at 0.873, CR is 0.910 and AVE is 0.671, and the CS construct is 0.820. These results imply two important issues: (1) internal reliability is good, and (2) the other indicators are effective to reflect more construct than error variance thus establishing convergent validity. The following interpretation of the structural model may be viewed as more convincing considering the high quality of the instrument used.

Table 4 Initial Reliability and Convergent Validity

Internal Reliabilities and Convergent Validity

	Cronbach's Alpha	Composite Reliability	AVE	Status
PA	0.859	0.906	0.706	Alpha OK, CR OK, AVE OK
ESQ	0.873	0.910	0.671	Alpha OK, CR OK, AVE OK
CS	0.925	0.948	0.820	Alpha OK, CR OK, AVE OK

AL	0.853	0.912	0.776	Alpha OK, CR OK, AVE OK
BL	0.882	0.929	0.813	Alpha OK, CR OK, AVE OK

The Fornell Larcker criterion and Heterotrait Monomethod (HTMT) ratio were used to assess discriminant validity and the aim of the assessment was to establish whether the measured constructs are empirically different to each other. The Fornell-Larcker method presupposes that the square root of the Average Variance Extracted (AVE) of individual constructs, which are the diagonal weights of the correlation matrix, should be greater than the inter-construct correlations. In the current data, e.g., the square root of the AVE of ESQ is 0.819, and the square root of the AVE of CS is 0.905; both are above the ESQ – CS correlation coefficient of 0.74, thus, indicating that each of them has a distinct identity. The HTMT analysis follows a conservative upper bound of 0.85 and a liberal bound of 0.90; most pairs of constructs are below the conservative value. The only exception, the AL, the BL pair (0.88) is within acceptable parameters since the two constructs are theoretically considered to be opposing aspects of loyalty, attitudinal and behavioral, which are expected to be close to each other. The results in turn substantiate the conclusion that the discriminant validity has been developed.

Table 5 Fornell-Lacker

	PA	**ESQ**	**CS**	**AL**	**BL**
PA	0.841	0.596	0.426	0.405	0.329
ESQ	0.596	0.819	0.74	0.583	0.491
CS	0.426	0.74	0.905	0.749	0.734
AL	0.405	0.583	0.749	0.881	0.763
BL	0.329	0.491	0.734	0.763	0.901

Table 6 Heterotrait-Monotrait Ratio (HTMT)

	PA	**ESQ**	**CS**	**AL**	**BL**
PA		0.671	0.479	0.475	0.383
ESQ	0.671		0.842	0.69	0.577
CS	0.479	0.842		0.842	0.812
AL	0.475	0.69	0.842		0.88
BL	0.383	0.577	0.812	0.88	

(c) Collinearity

Table IV.7 (Collinearity, VIF) evaluates the possibility of redundant indicators in reflective constructs. Ideally, the variance inflation factors are supposed to be lower than 3.3; those between 3.3 and 5 are regarded as moderate whereas those above 5 are supposed to be subject of closer examination. Most of the indicators are in the range of safe to moderate. The two indicators, PA G1 (6.379) and PA G2 (5.985) have a very high VIF, which indicates that these two gamification items are highly redundant. Such redundancy can be explained by the fact that the gamification construct was limited to two items, and both represent essentially the same pattern. However, because of the small number of gamification items, they were both accepted and there was an interpretative note on the same, the variance could be since gamification might be concentrated among the two similar statements and this would need to be increased in future studies.

Table 7 Collinearity of each indicator

Indicators	VIF
AL1	2.746
AL2	2.456
AL3	2.053
BL1	2.728
BL2	2.996
BL3	2.796
CS1	2.916
CS2	3.296
CS3	3.9
CS4	2.912
ESQ_C1	3.55
ESQ_C2	3.567
ESQ_F2	1.659
ESQ_S1	1.795
ESQ_S2	2.026
PA_G1	6.379
PA_G2	5.985
PA_L1	2.459
PA_L2	2.241

Structural Model Evaluation & Mediation Analysis

(a) Tokopedia

Table IV.8 has shown that the path coefficients of E-Service Quality (ESQ) has a strong impact on Customer Satisfaction (CS). This association is supported by the effect size (f^2) in Table IV.10 which shows that the ESQ → CS is equal to 1.157 which is associated with a coefficient of very large according to the thresholds of Cohen 0.02 small; 0.15 medium; 0.35 large. CS, in turn, has a positive effect on Customer Loyalty (CL), but the effect size is large ($f^2 = 0.366$), and the statistical significance of the path is rather marginal ($t \approx 1.77$), which is considered significant at the 10% range but rather insignificant at the 5% range. The ESQ → CL direction is relatively low ($f^2 = 0.024$) indicating that ESQ does not influence the loyalty of Tokopedia directly, but rather, it does it via its impact on satisfaction. Perceived Promotional Attractiveness (PPA) does not have a statistically significant influence on CS or CL; its coefficient to CS even shows a negative influence, though slightly.

Table 8 Path coefficients Tokopedia

	Original sample (O)	Sample mean (M)	Standard Deviation (STEDEV)	T statistic (|O/STEDEV|)	P values
CS → CL	0.669	0.625	0.378	1.77	0.077
ESQ → CL	0.04	0.064	0.229	0.173	0.863
ESQ → CS	0.894	0.841	0.243	3.679	<0.001
PPA → CL	0.082	0.08	0.26	0.315	0.753
PPA → CS	-0.416	-0.376	0.232	1.793	0.073
ESQ → CS → CL	0.598	0.529	0.36	1.662	0.096

PPA → CS → CL	-0.279	-0.238	0.231	1.206	0.228

The values of R^2 of 0.596 in CS and 0.592 in CL (Table 8) are considered to be good because the model can explain around 59% of the variation in the two key constructs – a fairly good level in the context of consumer behavior.

Table 9 R-square Tokopedia

	R-square	R-square adjusted
CL	0.592	0.577
CS	0.596	0.587

Table 10 F-square Tokopedia

	CL	CS	ESQ	PPA
CL				
CS	0.366			
ESQ	0.024	1.157		
PPA	0.003	0.015		

The Q^2 values (Table 11) for CS = 0.568 and CL = 0.411 > 0 indicate good predictive relevance.

Table 11 Q-square Tokopedia

	Q^2predict
CL	0.411
CS	0.568

The SRMR (Table 12) stands at about < 0.10 which is reckoned as sufficient to indicate sufficient model fit. Substantively, it is obvious: in the case of Tokopedia, it can be concluded that satisfy is largely being motivated by electronic service quality, which, in turn, leads to loyalty; promotions are not the factors that can evoke sustainable loyalty.

Table 12 SRMR Tokopedia

	Original sample (O)	Sample mean (M)	95%	99%
Saturated model	0.08	0.057	0.07	0.077
Estimated model	0.081	0.084	0.155	0.229

(b) Shopee

The structural coefficient of the pathway between expected service quality (ESQ) to consumer satisfaction (CS) f^2= 0.938 in Table 16, and that between pathway between customer loyalty (CL) and consumer satisfaction (CS) f^2= 0.863 are very large values. The obtained results prove that the two key relationships between service quality and satisfaction and satisfaction and loyalty are exceptionally influential in the context of Shopee. The direct impact of ESQ on CL is, however, very small (f^2 = 0.023), which highlights the fact that the most common path to loyalty takes place through satisfaction. In addition, the perceived product availability (PPA) does not have a statistically significant influence on either CS or CL.

Table 13 Path coefficients Shopee

	Original sample (O)	Sample mean (M)	Standard Deviation (STEDEV)	T statistic (|O/STEDEV|)	P values
CS → CL	0.864	0.857	0.074	11.659	<0.001
ESQ → CL	0.759	0.758	0.053	14.41	<0.001
ESQ → CS	0.12	0.119	0.061	1.969	0.049
PPA → CL	0.028	0.029	0.067	0.41	0.682
PPA → CS	-0.155	-0.154	0.096	1.622	0.105
ESQ → CS → CL	0.656	0.65	0.08	8.154	<0.001
PPA → CS → CL	0.024	0.025	0.058	0.411	0.681

Table 14 R-square Shopee

	R-square	R-square adjusted
CL	0.655	0.65
CS	0.602	0.598

Table 15 F-square Shopee

	CL	CS	ESQ	PPA
CL				
CS	0.863			
ESQ	0.023	0.938		
PPA	0.027	0.001		

As the R^2 values of CL (0.655) and CS (0.602) in Table 14 allow concluding, the explanatory power in terms of loyalty is slightly better than Tokopedia. At the same time, the positive Q^2 values of Table 16 indicate that the predictive power is still high. Moreover, a value of SRMR of about 0.088 is still considered to fit within acceptable fit limits.

Table 16 Q-square Shopee

	Q^2predict
CL	0.333
CS	0.587

Table 17 SRMR Shopee

	Original sample (O)	Sample mean (M)	95%	99%
Saturated model	0.088	0.045	0.054	0.059

Estimated model	0.088	0.045	0.054	0.059

In short, in the framework of Shopee, the core strategy does not change, only the intensity of its implementation is increasing: the focus on the improvement of Enterprise Service Quality (ESQ) to increase Customer Satisfaction (CS), which, in its turn, is the key predictor of Customer Loyalty (CL). Promotional programs that do not rely on other incentives like improvement in the quality of service are not able to create lasting loyalty.

Model Comparison: Tokopedia vs Shopee

(a) Measurement Invariance of Composite Models

The compositional invariance assumption was supported by the MICOM analysis (Tables IV.18-IV.20) and thus allowed the comparison of paths across platforms. However, Step 3b indicated that there was a statistically significant difference in the mean and the variance of perceived promotional attractiveness (PPA) between the Shopee and Tokopedia groups ($p = 0.011$). As a result, the initial understanding of the concept of promotional attractiveness is not the same between the two platforms and one should exercise caution on the interpretation of the difference in the promotional effects.

Table 18 MICOM step 2

	Original correlation	Correlation permutation mean	5%	Permutation p value
CL	1	1	0.999	0.495
CS	1	1	1	0.889
ESQ	0.998	0.999	0.996	0.246
PPA	0.989	0.995	0.981	0.11

Table 19 MICOM 3a

	Original difference	Permutation mean difference	2.5%	97.5%	Permutation p value
CL	0.062	-0.005	-0.249	0.26	0.646
CS	-0.007	-0.002	-0.236	0.247	0.953
ESQ	-0.129	-0.002	-0.247	0.241	0.33
PPA	0.195	-0.008	-0.261	0.258	0.124

Table 20 MICOM step 3b

	Original difference	Permutation mean difference	2.5%	97.5%	Permutation p value
CL	0.209	0.053	-0.743	0.702	0.761
CS	0.197	0.038	-0.661	0.571	0.711
ESQ	0.191	0.014	-0.498	0.493	0.497
PPA	-0.498	0.024	-0.375	0.439	0.011

(b) Multi-Group Analysis

The multi-group analysis (Table 21) finds that there are no statistically significant differences in the path coefficients of the two platforms of the main pathways (such

as despite the larger coefficient of CS → CL in the Shopee sample, the p -value associated with it is about 0.112, which is not enough to meet the traditional significance threshold of 0.05). The structural designs of the two platforms, therefore, seem to be similar: the chain of ESQ → CS → CL is the central process of making loyalty, and promotion does not have a primary impact on loyalty.

Table 21 MGA

	Original (Platform_Shopee)	Original (Platform_ Tokopedia)	Original difference	Permutation mean difference	2.50 %	97.50 %	Permutation p value
CS → CL	0.864	0.608	0.257	0.011	-0.299	0.329	0.112
ESQ → CL	-0.155	0.176	-0.33	0.006	-0.362	0.364	0.077
ESQ → CS	0.759	0.821	-0.061	0.009	-0.168	0.209	0.519
PPA → CL	0.12	0.042	0.078	-0.009	-0.2	0.188	0.467
PPA → CS	0.028	-0.094	0.122	-0.013	-0.238	0.202	0.275
ESQ → CS → CL	0.656	0.499	0.158	0.014	-0.304	0.308	0.332
PPA → CS → CL	0.024	-0.057	0.081	-0.01	-0.188	0.159	0.376

Predictive Assessment

The indicators level (Table 22) indicates that many items have a positive Q^2 predict value and the root-mean-square error of prediction (RMSE) and mean absolute error (MAE) of the partial least squares structural equation modeling (PLS-SEM) are similar to those of the linear benchmark model.

Table 22 PLS predict MV summary

	Q2 predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE	IA_RMSE	IA_MAE
AL1	0.203	0.812	0.588	0.789	0.567	0.91	0.706
AL2	0.334	0.776	0.58	0.767	0.546	0.951	0.754
AL3	0.275	0.812	0.627	0.801	0.599	0.953	0.774
BL1	0.225	0.759	0.556	0.74	0.531	0.862	0.687
BL2	0.181	0.741	0.543	0.723	0.523	0.819	0.66
BL3	0.193	0.764	0.543	0.751	0.526	0.85	0.668
CS1	0.449	0.628	0.462	0.628	0.45	0.846	0.649
CS2	0.527	0.586	0.443	0.582	0.42	0.852	0.65
CS3	0.480	0.625	0.461	0.606	0.45	0.866	0.668
CS4	0.422	0.642	0.461	0.59	0.424	0.845	0.661

The Q^2 predict for both CS and CL is positive at the construct level (Table 23) where the regression estimates lie within the range of about 0.48 to 0.58 in CS and 0.33 to 0.35 in CL. This finding suggests that the model is not only explaining the variance in the data, but it also carries predictive ability as to future scores. Regarding the managerial implementation perspective, the results indicate that the constructs ESQ and CS are effective operative indicators to be used in monitoring and intervention.

Table 23 PLS predict LV summary

	Q2 predict	RMSE	MAE
CL	0.35	0.829	0.58
CS	0.582	0.66	0.479

Robustness Check

(a) Endogeneity Test

The test to detect bias in a case of unobserved variables uses the Gaussian copula method as shown in Table IV.24 (Endogeneity Test). These findings show that the CS → CL pathway ($p \approx 0.035$) and PPA-related pathways ($p \approx 0.011–0.014$) are endogenous. Such p-values are not ideal since they suggest that it is possible that an estimation is affected by unaccounted factors in the model like trust, habit, switching costs, or brand preference. The methodological conclusion is that although the general pattern of relationships, namely, ESQ → CS CL, is consistent, the extent of effects, especially the ones related to promotions, should be approached with care, further research, using the experimental or the longitudinal design, is recommended to strengthen causal inference.

Table 24 Endogeneity Test Result

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
GC (CS → CL) → CL	-0.136	-0.117	0.064	2.111	0.035
GC (ESQ → CL) → CL	0.036	0.041	0.069	0.513	0.608
GC (ESQ → CS) → CS	-0.147	-0.138	0.094	1.561	0.119
GC (PPA → CL) → CL	0.051	0.05	0.06	0.848	0.397
GC (PPA → CS) → CS	0.177	0.179	0.072	2.469	0.014
GC (ESQ → CS) → CL	-0.146	-0.136	0.096	1.522	0.128

GC (PPA → CS) → CL	0.177	0.171	0.07	2.536	0.011
GC (PPA → CS) → CS → CL	0.177	0.171	0.07	2.536	0.011
GC (ESQ → CS) → CS → CL	-0.146	-0.136	0.096	1.522	0.128

(b) Heterogeneity Test

Table IV.25 (Heterogeneity Test) indicates that there are numerous segments with different quality in classification, and this aspect is seen by the high explanatory and fit indices in segments 1-2 which decrease in segments 3-4. The phenomenon is an acceptable measure of heterogeneity in behaviours, in the sense that not every user has the same response patterns. Based on this, segmentation strategy (e.g., service-first users vs. value seekers) is likely to be more effective than strategic interventions, and help in explaining why financial promotions (e.g., discounts or free shipping) do not increase loyalty on average; their impact might be focussed in sub-segments and not across the whole population.

Table 25 Heterogeneity Test Result

	AIC (Akaike's information criterion)	**BIC (Bayesian information criterion)**	**CAIC (consistent AIC)**	**EN (normed entropy statistic)**	**NFI (non-fuzzy index)**
Segment 1	1145.149	1171.052	1178.052	0	0
Segment 2	879.061	934.567	949.567	0.971	0.98
Segment 3	851.433	936.543	959.543	0.837	0.823
Segment 4	812.386	927.1	958.1	0.651	0.61

The purification of the measurement model left Promotional Pricing Activities (PPA) represented mainly by experiential elements and Electronic Service Quality (ESQ) dominated by service and security indicators, meaning causal results must be interpreted within these refined constructs. Across both platforms, ESQ strongly predicts customer satisfaction (CS), and CS is the primary driver of customer loyalty (CL), while promotions—discounts, vouchers, and free shipping—show no significant direct or indirect impact on satisfaction or loyalty. In Tokopedia, the ESQ → CS effect is exceptionally strong, but promotions tend to create expectation gaps that reduce satisfaction when service reliability is inconsistent. Similarly, Shopee's loyalty pathway is driven entirely by ESQ and CS, with promotional attractiveness again showing no predictive value. At the industry level, the results indicate that discounts have become commoditized and no longer differentiate brands; sustainable loyalty now depends on fast, reliable, secure, and fair service.

Managerial implications therefore emphasize investing in end-to-end service quality—clear SLAs, faster refunds, consistent fulfillment, stronger security—and treating promotions as targeted, service-linked enhancements rather than substitutes for service excellence. Tokopedia should prioritize speeding issue resolution and improving refund transparency, while Shopee should maintain rapid response speed and reinforce security at high-risk touchpoints. Personalized promotions tied to service benefits can support satisfaction but cannot generate loyalty alone. Overall, durable loyalty in Indonesia's e-commerce duopoly is achieved not through price subsidies but through consistently dependable service experiences.

The results show that electronic service quality (ESQ) is the strongest and most consistent driver of customer satisfaction (CS) on both Shopee and Tokopedia, and CS is the main pathway to customer loyalty (CL). Promotions, however, have no significant direct or indirect impact on satisfaction or loyalty, even after refining promotional indicators. This means that loyalty in Indonesia's e-commerce duopoly is built through reliable, fast, secure, and fair service—not through aggressive promotional campaigns. Accordingly, promotions should be repositioned as targeted, context-specific enhancers that support service improvements rather than as standalone loyalty tools.

Managerial recommendations therefore prioritize upgrading end-to-end ESQ: faster and more transparent issue resolution, clearer service-level agreements, improved refund processes, stronger transaction security, and stricter fulfilment governance through seller scorecards and logistics SLAs. Promotions should be personalized, category-relevant, and bundled with service benefits such as priority support or extended return windows. For Tokopedia, urgent focus should be placed on accelerating refund and problem-resolution processes, while Shopee should strengthen response speed, first-contact resolution, and high-risk security controls. Overall, redistributing resources from mass promotions to service excellence yields stronger, more sustainable gains in satisfaction, repeat purchases, and long-term loyalty.

CONCLUSION

The findings indicate that long-term customer loyalty in Indonesia's e-commerce duopoly is predominantly driven by electronic service quality (ESQ) rather than short-term promotional incentives. While discounts, vouchers, and free shipping have become baseline expectations that no longer differentiate platforms, reliable end-to-end service—such as fast issue resolution, transparent refunds, secure transactions, and consistent fulfillment—directly enhances customer satisfaction, which in turn serves as the primary pathway to loyalty. Promotions only influence satisfaction or loyalty when they are personalized, contextually relevant, and clearly linked to service benefits. Consequently, Tokopedia and Shopee should focus on strengthening service excellence while aligning promotions to support the service experience. At the industry level, these results suggest that sustainable loyalty will be earned through consistent, trustworthy, and high-quality experiences rather than price competition. Future research could examine how emerging technologies, such as AI-driven personalization or real-time service monitoring, further enhance service quality and its impact on long-term loyalty in Indonesia's dynamic e-commerce market.

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