

The Effect of Complaint Handling on Customer Loyalty Mediated by Customer Satisfaction: Exploring the Role of Customer Characteristics as a Moderating Variable

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Abstract: Indonesia has become one of the largest online transportation markets, with Grab facing increasingly intense competition from platforms such as Gojek and Maxim. Along with the rapid growth of service usage, customer complaints related to driver behavior, fare discrepancies, and service inconsistency have also increased, making effective complaint handling a critical factor in maintaining customer loyalty. Therefore, this study aims to examine the effect of complaint handling on customer loyalty, with customer satisfaction as a mediating variable and customer characteristics as moderating variables. This research employed a quantitative approach using purposive sampling of 150 Grab users in Indonesia who had experienced service-related complaints within the past 6–12 months. Data were collected through a structured questionnaire and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with SmartPLS 4. The findings indicate that complaint handling has a positive and significant effect on customer satisfaction and customer loyalty. Customer satisfaction significantly mediates the relationship between complaint handling and loyalty, while customer characteristics, particularly age, education, and income, significantly moderate the relationship between satisfaction and loyalty. These findings highlight the strategic role of complaint handling in strengthening long-term customer loyalty in the online transportation industry.

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INTRODUCTION

Indonesia has become one of the largest online transportation markets in the world, reflecting the rapid expansion of digital platform services in emerging economies. The Digital 2025 Global Statshot Report by We Are Social and Meltwater reported that 66.7% of internet users aged 16 years and above in Indonesia used online mobility services during the fourth quarter of 2024, placing Indonesia among the highest globally in the adoption of ride-hailing applications. This condition indicates that online transportation services have become an essential part of daily mobility and urban lifestyles in Indonesia. As one of the dominant market players, Grab operates in a highly competitive environment alongside Gojek and Maxim, where companies continuously compete through pricing strategies, promotional programs, technological innovation, and service quality improvements. or *online mobility services* in Indonesia far exceeds that of



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neighboring countries and is the highest among the approximately 50 countries surveyed.

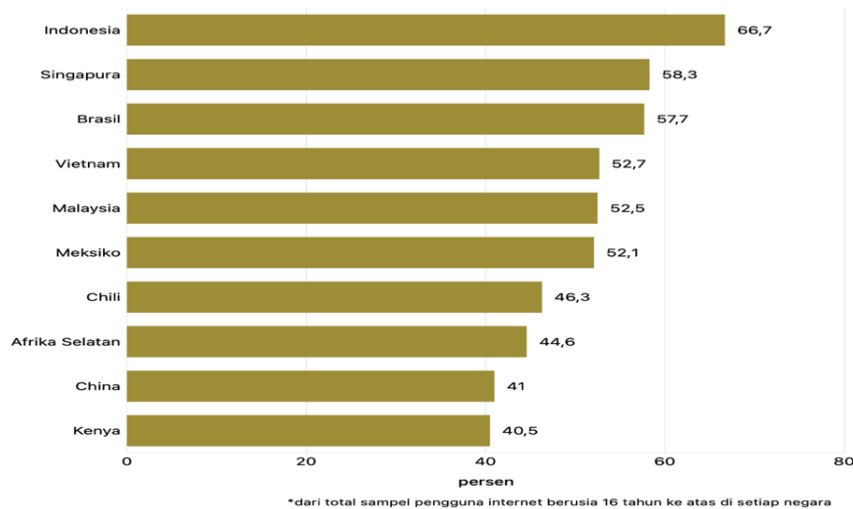


Figure 1. Percentage of Online Transportation App Users

Source: We Are Social (2025), processed from Databoks Katadata (2025)

In such a competitive market, customer loyalty becomes increasingly important because switching costs between digital platforms are relatively low. Customers can easily move to competing applications when they experience dissatisfaction. However, service failures remain common in online transportation services, including order cancellations, delays, driver behavior issues, route inaccuracies, pricing disputes, and inconsistent service experiences. When such failures occur, effective complaint handling becomes a critical strategy to restore customer trust and maintain long-term relationships. Complaint handling refers to the firm's ability to receive, respond to, and resolve customer complaints fairly, promptly, and satisfactorily. Prior studies have shown that effective complaint handling can improve post-service evaluations and strengthen customer relationships (Ahmed et al., 2020; Badawi et al., 2021; Shams et al., 2020a).

Previous research generally supports the positive relationship between complaint handling, customer satisfaction, and customer loyalty. For example, Ahmed et al. (2020) found that organizational complaint handling positively affects customer satisfaction and loyalty in the airline industry. Similarly, (Susanti, 2021) and (Fadilah et al., 2023) found that complaint handling significantly increases loyalty through customer satisfaction as a mediating variable. These findings imply that customers tend to remain loyal when they perceive that their complaints are handled professionally and fairly. However, several studies also reported that the direct influence of complaint handling on loyalty may become weak or insignificant when satisfaction is not achieved, indicating that satisfaction plays an important explanatory mechanism in post-complaint behavior (Ngoc Quang & Thuy, 2023; Shams et al., 2020a).

Although these relationships have been widely examined, most previous studies focused on traditional service sectors such as banking, hospitality, airlines, and retail. Empirical evidence in ride-hailing platforms remains limited, especially in developing countries. This represents an important theoretical gap because digital transportation platforms possess unique characteristics, including real-time service encounters, app dependency, two-sided interactions between customers and drivers, and high switching flexibility. Therefore, conclusions derived from conventional industries may not be fully generalizable to the online transportation context in Indonesia.

Another important gap concerns the limited discussion regarding heterogeneous customer responses. Customers with different demographic and socioeconomic

backgrounds may evaluate the same complaint resolution differently. Recent studies indicate that customer characteristics can moderate the relationship between complaint handling, satisfaction, and loyalty. (Morgeson et al., 2020) found that the impact of complaint handling on loyalty varies across customer groups (Chikazhe et al., 2021) and (Schirmer et al., 2018) also reported that customer characteristics significantly influence the strength of the satisfaction–loyalty relationship. These findings suggest that similar complaint handling efforts may produce different loyalty outcomes depending on customer profiles. In the Indonesian market, this issue is highly relevant because consumers differ considerably in age, education, income, and digital experience.

Based on these arguments, this study offers three contributions. First, it extends complaint handling literature into the context of ride-hailing services in Indonesia as one of the world's largest digital mobility markets. Second, it clarifies the mediating role of customer satisfaction in explaining how complaint handling affects customer loyalty. Third, it enriches the literature by examining customer characteristics as moderating variables, thereby explaining why complaint handling strategies may be more effective for certain customer segments than others. By focusing on Grab users in Indonesia, this study contributes not only to managerial practices in the transportation platform industry but also to global literature on service recovery, customer retention, and digital competition in emerging markets.

LITERATURE REVIEW

Service failure is unavoidable in service industries, especially in digital platform businesses where customer expectations for speed, convenience, and responsiveness are high. In this context, complaint handling becomes an important strategy to restore customer trust after negative experiences. Complaint handling refers to a company's efforts to receive, investigate, and resolve complaints fairly and effectively. Prior studies confirm its importance, although the outcomes vary across industries. (Shams et al., 2020a) found that complaint handling significantly improves customer satisfaction and brand credibility in banking, while (Ahmed et al., 2020) reported positive effects on satisfaction and loyalty in airlines. More recently, studies in digital transportation services also highlight the importance of service recovery because dissatisfied users can easily switch to competing platforms (Katili et al., 2024; Shamsudin & Bakar Abu R.A, 2022) These findings indicate that complaint handling is increasingly relevant in ride-hailing services such as Grab.

Although previous studies generally conclude that complaint handling increases customer satisfaction, satisfaction depends not only on receiving a response but also on the fairness of that response. (Tax et al., 1998) explained that procedural, distributive, and interactional justice shape customer evaluations after service recovery. Supporting this view, (Badawi et al., 2021) found that distributive and informational justice significantly improve satisfaction with complaint handling. In digital transportation services, where customers expect quick responses and clear solutions, these factors become increasingly important. Therefore, the following hypothesis is proposed:

H1: Complaint Handling has a positive effect on Customer Satisfaction.

Customer satisfaction is widely recognized as a key antecedent of loyalty. (Oliver, 1999) defined loyalty as a strong commitment to repurchase consistently in the future. (Khan et al., 2022) found that customer satisfaction significantly mediates the relationship between customer relationship management and loyalty. Empirical evidence continues to support this argument. (Khan et al., 2022) found that customer satisfaction significantly mediates the relationship between customer relationship management and loyalty. (Dam & Dam, 2021) also confirmed that satisfied customers are more likely to repurchase and recommend the service. In ride-hailing contexts, (Katili et al., 2024) found that customer satisfaction remains a significant predictor of continued usage intention and loyalty. However, because switching barriers in digital markets are

relatively low, satisfied customers may still move to competitors when better prices or incentives are offered. Therefore, the following hypothesis is proposed:

H2: Customer Satisfaction has a positive effect on Customer Loyalty.

The direct relationship between complaint handling and loyalty remains inconclusive. (Ahmed et al., 2020) found a significant direct effect, while (Morgeson et al., 2020) showed that effective complaint handling can turn dissatisfied customers into loyal customers under certain conditions. However, customers may still leave if recurring issues such as cancellations, delays, or price fluctuations continue. Therefore:

H3: Complaint Handling has a positive effect on Customer Loyalty.

Recent studies provide stronger support for mediation mechanisms. (Susanti, 2021) found that complaint handling satisfaction mediates the relationship between complaint handling and loyalty. (Rather & Hollebeek, 2021) also concluded that service recovery influences loyalty primarily through satisfaction. (Ngoc Quang & Thuy, 2023) further demonstrated that fairness and trustworthiness improve loyalty through satisfaction with complaint handling. These findings imply that loyalty emerges when the recovery process restores fairness, value, and confidence. Therefore:

H4: Complaint Handling positively affects Customer Loyalty through Customer Satisfaction.

Another limitation in prior studies is the assumption that all customers respond similarly. Recent scholarship emphasizes customer heterogeneity. (Chikazhe et al., 2021; Morgeson et al., 2020; Schirmer et al., 2018) found that customer characteristics moderate the relationship between satisfaction and loyalty. (Ku et al., 2021) also showed that individual traits influence reactions to complaint handling in digital settings. These findings indicate that demographic and psychological factors should be considered in loyalty models.

In Indonesia, this issue is highly relevant because ride-hailing users have diverse socioeconomic backgrounds. Older customers may value reliability more strongly than younger users. This argument is supported by (Rather & Hollebeek, 2021), who found that age moderates the relationship between customer experience and revisit intention. (Islam et al., 2021) also confirmed that age moderates the effect of satisfaction on loyalty. Highly educated customers may evaluate service quality more critically, while higher-income users often face lower switching constraints and can move more easily to alternative platforms. Therefore, age, education, and income are meaningful moderators. Based on these arguments, the following hypotheses are proposed:

H5: The positive effect of Customer Satisfaction on Customer Loyalty is stronger among older customers than younger customers.

H6: The positive effect of Customer Satisfaction on Customer Loyalty is weaker among customers with higher education levels than those with lower education levels.

H7: The positive effect of Customer Satisfaction on Customer Loyalty is weaker among higher-income customers than lower-income customers.

Overall, this study extends complaint handling theory into Indonesia's ride-hailing market, clarifies the mediating role of satisfaction, and incorporates customer heterogeneity through moderation analysis. By focusing on one of the largest digital transportation markets in the world, this study contributes to broader discussions on service recovery, customer retention, and platform competition.

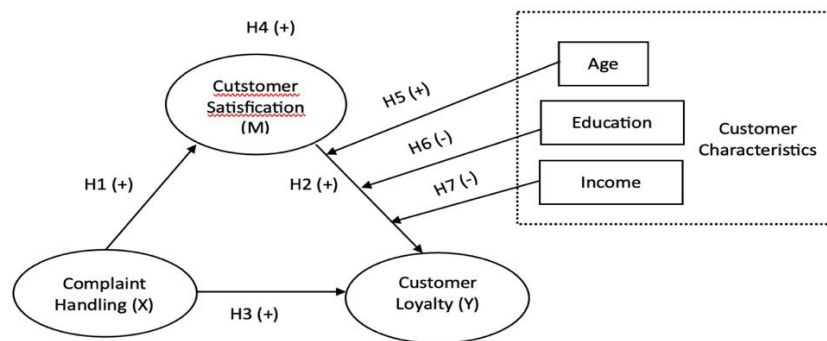


Figure 2. Conceptual Framework
 Source: Processed by the author (2025)

METHOD

This study employs a quantitative approach based on a conceptual framework that positions customer satisfaction as the psychological mechanism mediating the effect of complaint handling on customer loyalty. The primary research instrument consists of a questionnaire using a 1–5 Likert scale distributed to respondents who are users of *online* transportation services (e.g., Grab and Gojek), in accordance with the recommendation (J. , Hair et al., 2021) stating that research instruments generally use a 5- or 7-point Likert scale to measure respondents’ perceptions and attitudes.

Table 1. Operational Definitions of Variables

Variable	Indicator Components	Measurement
Complaint Handling (Susanti, 2021)	Expectations for Improvement	I really hope that Grab will Resolving the issues I’ve experienced with the Grab app.
	Commitment to Customer Satisfaction	I hope Grab will make every effort necessary to ensure my satisfaction as a customer.
	Fast and Efficient	I am confident that Grab will resolve my complaint or issue quickly and efficiently.
	Compensation	I strongly hope that Grab will provide compensation or reimbursement regarding the issue I raised on the Grab app.
Customer Satisfaction (Susanti, 2021)	Satisfaction with Problem Resolution	I feel that Grab has addressed my complaint with a satisfactory solution.
	Handling Satisfaction	I am satisfied with how Grab handled the issue I experienced with the Grab app.
Customer Loyalty (Arshad & Haroon, 2023)	Satisfaction Across All Aspects	I am satisfied with all the solutions provided by Grab for all the issues I raised regarding the Grab app service.
	Positive Reviews	I have shared positive reviews about the Grab app service with my professional colleagues or friends.
	Recommendations	I have recommended the Grab app service to professional colleagues or friends who have asked me for advice.
	Influencing Others	I have encouraged others to use the Grab app.

Variable	Indicator Components	Measurement
Customer Characteristics (<i>Moderator</i>) (Badan Pusat Statistik Indonesia, 2023; Badan Pusat Statistik Kabupaten Padang Lawas Utara, 2022; Provinsi Jambi Dalam Angka 2025, 2025)	Top Choice	I consider Grab to be my top choice when it comes to using <i>online</i> transportation services.
	Intention to Use Again	I will continue to use the Grab app for the next few years.
	Customer Age	1 = 15–19 years old, 4 = 30–34 years old, 2 = 20–24 years old, 5 = 35 years and older 3 = 25–29 years,
	Highest Level of Education	1 = Never attended school, 2 = Elementary school or equivalent, 3 = Junior High School or Equivalent, 4 = High School/Vocational High School or equivalent 5 = Associate's Degree / Bachelor's Degree / Master's Degree
	Monthly Income	1 = < Rp3,000,000 2 = Rp3,000,000 – Rp4,999,999 3 = Rp5,000.000 – Rp7,499.999 4 = Rp7,500.000 – Rp9,999.9999 5 = ≥ IDR 10,000,000

Source: processed by the author (2025)

The sample for this study was determined using purposive sampling, a technique for selecting respondents based on specific criteria relevant to the research objectives. The selected respondents were active users or those who had used the Grab app within the past 6–12 months, were at least 15 years old, had experienced issues or complaints related to Grab’s services, and resided in Indonesia. The purposive sampling technique is considered relevant in service research because it allows researchers to obtain data from respondents who have direct experience with the phenomenon under study (Ngoc Quang & Thuy, 2023).

The sample size was determined based on guidelines (Hair, 2021), which states that the minimum sample size should be five to ten times the number of indicators used in the research model. In this study, there were approximately 15 indicators adapted from theory and previous research; therefore, the minimum required sample size was 150 respondents.

The data analysis for this study utilized Structural Equation Modeling–Partial Least Squares (SEM-PLS) with the assistance of SmartPLS 4 (J. , J. F. Hair et al., 2022). Model evaluation was conducted in two stages: the outer model and the inner model. In the outer model, the tests included convergent validity, discriminant validity, and construct reliability using the criteria of outer loading ≥ 0.70, AVE ≥ 0.50, Cronbach’s Alpha and Composite Reliability ≥ 0.70, as well as Fornell-Larcker, HTMT, and cross-loading tests (Hair et al., 2022). Next, the inner model was used to test VIF, R², Q², f², and path coefficients. Hypothesis testing was performed using 5,000 bootstrap resamples with criteria of the t-statistic > 1.96 and the p-value < 0.05. Mediation testing was conducted via the indirect effect, while moderation testing was performed using the interaction term (product indicator) approach, which involves creating an interaction construct between customer satisfaction and each moderator variable (age, education, and income) to assess whether customer characteristics strengthen or weaken the influence of satisfaction on loyalty (J. , J. F. Hair et al., 2022).

RESULTS AND DISCUSSION

A total of 150 valid questionnaires were successfully analyzed and represent the final sample of app users who have previously submitted complaints via the Grab app in Indonesia. The demographic details of the respondents and their usage characteristics (as summarized in Table 2) indicate a diverse sample based on the data compiled from the total of 150 respondents.

Table 2. Respondent Data

Characteristics	Descriptive	Frequency	Percentage
Gender	Male	64	43%
	Female	86	57%
Residence (Major Islands in Indonesia)	Java	74	49.33
	Kalimantan Island	39	26%
	Papua Island	5	3.33%
	Sulawesi Island	1	0.67%
	Sumatra Island	31	20.67%
Age (Years)	>35 years	59	39%
	20–24 years	2	1%
	25–29 years	12	8
	30–34 years	77	51
Duration of App Use	6–12 months	33	22%
	1–2 years	45	30%
	> 2 years	72	48
App Usage Frequency	Rarely (1–3 times per month)	24	16
	Moderate (1–2 times per week)	66	44
	Frequent (≥ 3 times per week)	60	40

Source: processed by the author (2025)

Outer Model Testing

Before testing the hypotheses, we assessed the measurement model to ensure the constructs were measured reliably and validly. All item factor loadings were high (≥ 0.70 , as illustrated in Figure 3), indicating that each indicator was strongly associated with its intended latent construct and thus providing evidence of good convergent validity at the item level.

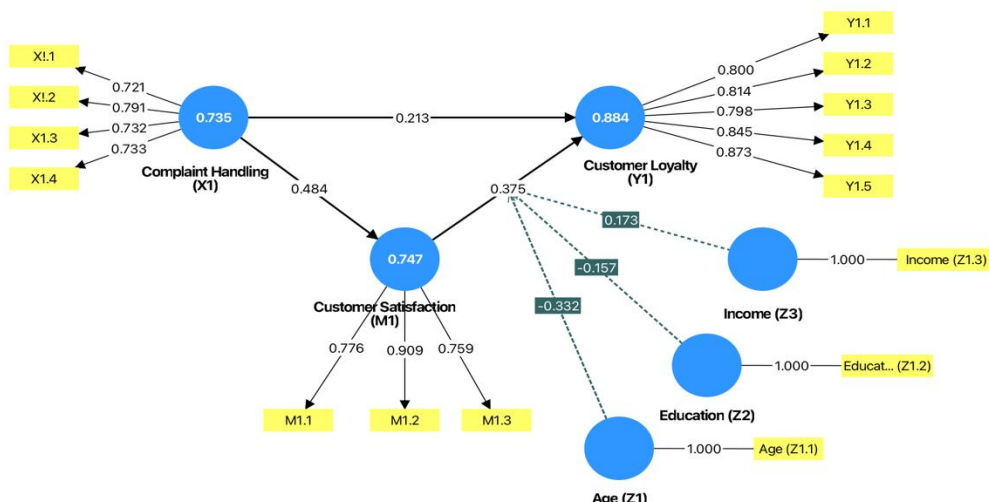


Figure 3. Outer Loadings

Source: processed by the author (2025)

Additionally, as shown in Table 3, every construct achieved an Average Variance Extracted (AVE) well above the 0.50 threshold, further confirming convergent validity for the set of indicators representing that construct. The constructs also demonstrated strong internal consistency: each one had a Cronbach's alpha, rho_A, and composite reliability value exceeding 0.70, indicating that the items used to measure each construct were consistently capturing the same underlying concept, which means the indicators are reliable.

Table 3. Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted ($\sqrt{\lambda}$, AVE)
Complaint Handling	0.747	0.746	0.857	0.668
Customer Satisfaction	0.884	0.886	0.915	0.683
Customer Loyalty	0.735	0.740	0.833	0.555

Source: processed by the author (2025)

Discriminant validity was assessed using the Fornell–Larcker criterion, which deems validity adequate when the square root of each construct's AVE exceeds its correlations with all other constructs. As reported in Table 4, this condition is satisfied: the diagonal elements (\sqrt{AVE}) for every construct are larger than the corresponding inter-construct correlations, indicating that each construct shares more variance with its own indicators than with any non-target construct.

Table 4. Fornell–Larcker criterion

	Customer Satisfaction	Customer Loyalty	Complaint Handling	Income	Education	Age
Customer Satisfaction	0.817					
Customer Loyalty	0.366	0.827				
Complaint Handling	0.484	0.266	0.745			
Income	0.225	0.264	0.222	1.000		
Education	0.207	-0.059	0.190	0.230	1.000	
Age	0.433	0.181	0.499	0.424	0.207	1.000

Source: processed by the author (2025)

Cross-loading analysis was conducted to assess discriminant validity at the indicator level. The criterion requires each indicator to exhibit the highest loading on its intended construct relative to all non-target constructs. As shown in Table 5, all indicators load most strongly on their respective constructs, while cross-loadings on other constructs are markedly lower, indicating that each indicator represents its underlying construct more strongly than any alternative construct. Accordingly, discriminant validity based on cross-loadings is also supported.

Table 5. Cross-Loadings

	Complaint Handling	Customer Satisfaction	Customer Loyalty	Age	Education	Income
X1.1	0.721	0.320	0.083	0.445	0.238	0.144
X1.2	0.791	0.297	0.274	0.275	0.132	0.165
X1.3	0.732	0.467	0.159	0.442	0.103	0.120
X1.4	0.733	0.326	0.261	0.324	0.121	0.235
M1.1	0.384	0.776	0.266	0.372	0.204	0.205
M1.2	0.422	0.909	0.237	0.333	0.173	0.154
M1.3	0.377	0.759	0.381	0.351	0.134	0.189
Y1.1	0.261	0.335	0.800	0.176	0.042	0.269
Y1.2	0.160	0.365	0.814	0.175	-0.050	0.151
Y1.3	0.165	0.242	0.798	0.023	-0.171	0.113
Y1.4	0.266	0.281	0.845	0.191	-0.044	0.278
Y1.5	0.233	0.285	0.873	0.166	-0.036	0.262
Z1	0.499	0.433	0.181	1.000	0.207	0.424
Z2	0.190	0.207	-0.059	0.207	1.000	0.230
Z3	0.222	0.225	0.264	0.424	0.230	1.000

Source: processed by the author (2025)

Inner Model

The structural model was evaluated by examining the R-Square (R^2) and Adjusted R-Square values for the endogenous variables. The R-Square value is used to measure the ability of exogenous variables to explain the variation in the endogenous variables within the research model. The higher the R-Square value, the better the model's ability to explain the endogenous construct. According to Hair (2021), R-Square values of 0.75, 0.50, and 0.25 can be categorized as substantial, moderate, and weak, respectively.

Table 6. R-Square Test

	R-Square Value	Adjusted R-Square
Customer Satisfaction (M1)	0.235	0.229
Customer Loyalty (Y1)	0.331	0.293

Source: processed by the author (2025)

Based on Table 6, the Customer Satisfaction variable (M1) has an R-Square value of 0.235 and an Adjusted R-Square of 0.229, indicating that Complaint Handling explains 23.5% of the variation in Customer Satisfaction, while the remaining 76.5% is explained by other variables outside the model. Meanwhile, the Customer Loyalty variable (Y1) has an R-Square value of 0.331 and an Adjusted R-Square of 0.293, meaning that Complaint Handling, Customer Satisfaction, and the moderating variable of customer characteristics can explain 33.1% of the variation in Customer Loyalty, while the remaining 66.9% is influenced by other factors outside the research model. Overall, both R-Square values fall into the weak category, yet they still indicate that the model possesses sufficient ability to explain the endogenous variables.

Table 7. Multicollinearity Test

VIF	Customer Satisfaction	Customer Loyalty
Customer Satisfaction		1.450
Complaint Handling	1,000	1,610
Income		1,301
Education		1,390
Age		1,838

VIF	Customer Satisfaction	Customer Loyalty
Income x Customer Satisfaction		1,413
Education x Customer Satisfaction		1,630
Age x Customer Satisfaction		1,429

Source: processed by the author (2025)

The VIF values for all variables are below 5, ranging from 1.000 to 1.838. This indicates that the research model does not suffer from multicollinearity, so the relationships between the independent variables and the moderating variable in the model are still valid for further analysis. According to (Hair, 2021), the VIF value < 5 indicates the absence of multicollinearity.

Hypothesis Testing

Hypothesis testing assessed whether the modeled relationships were statistically significant and, consequently, whether the proposed hypotheses were supported or rejected. Significance was estimated using the bootstrapping procedure in SmartPLS 4.0 at $\alpha = 0.05$, with the results summarized in Table 7 below.

Hypothesis testing criteria in PLS-SEM are based on the t-statistic and p-value from the bootstrapping results. A hypothesis is considered significant if the t-statistic is > 1.96 and the p-value is < 0.05 at a 5% significance level. Furthermore, the direction of the relationship is determined by the path coefficient, where a positive coefficient indicates a positive relationship, while a negative coefficient indicates a negative relationship. This criterion refers to (J. , J. F. Hair et al., 2022), which states that the evaluation of structural models is conducted through the significance of paths based on bootstrapping results.

Table 8. Hypothesis Test Summary of Direct Effect

Hypothesis	Variable	Coefficients	(STDEV)	T-stat	P-Values	Results
H1	Complaint Handling (X1) -> Customer Satisfaction (M1)	0.484	0.063	7,678	0.000	Positive and Significant
H2	Customer Satisfaction (M1) -> Customer Loyalty (Y1)	0.375	0.095	3.962	0.000	Positive and Significant
H3	Complaint Handling (X1) -> Customer Loyalty (Y1)	0.213	0.088	2.433	0.008	Positive and Significant
H5	Age (Z1) x Customer Satisfaction (M1) -> Customer Loyalty (Y1)	-0.332	0.084	3.957	0.000	Negative and significant moderation (weakening)

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Hypothesis	Variable	Coefficients	(STDEV)	T-stat	P-Values	Results
H6	Education (Z2) x Customer Satisfaction (M1) -> Customer Loyalty (Y1)	-0.157	0.092	1.700	0.045	Negative and significant moderation (weakening)
H7	Income (Z3) x Customer Satisfaction (M1) -> Customer Loyalty (Y1)	0.173	0.081	2.144	0.016	Positive and significant moderation (reinforcing)

Source: processed by the author (2025)

Table 9. Hypothesis Test Summary of Indirect Effect

Hypothesis	Variable	Original Sample (O)	(STDEV)	T-stat	P-Values	Results
H4	Complaint Handling (X1) -> Customer Satisfaction (M1) -> Customer Loyalty (Y1)	0.182	0.047	3.878	0.000	Mediates relationship

Source: processed by the author (2025)

Based on the results of hypothesis testing in the structural model, it was found that complaint handling has a positive and significant effect on customer satisfaction. This is indicated by a coefficient value of 0.484, the t-statistic of 7.678, and the p-value of 0.000, all of which meet the significance criteria. These findings indicate that the better a company is at handling customer complaints, the higher the level of satisfaction felt by customers. Prompt, appropriate, and fair complaint handling can foster a positive customer perception of the company's service quality. These results align with research (Shams et al., 2020a) explaining that effective complaint handling plays a crucial role in enhancing customer satisfaction because customers feel their issues are addressed and resolved properly.

Furthermore, customer satisfaction was also found to have a positive and significant effect on customer loyalty, with a coefficient of 0.375, the t-statistic of 3.962, and the p-value of 0.000. These results indicate that satisfied customers are more likely to maintain their relationship with the company, make repeat purchases, and recommend the service to others. The higher the level of satisfaction felt, the greater the likelihood that customers will exhibit loyal behavior. This finding supports research (Kataria & Saini, 2020; Khan et al., 2022) stating that satisfaction is a key factor driving long-term customer loyalty.

In addition, complaint handling also has a positive and significant direct effect on customer loyalty, with a coefficient of 0.213, the t-statistic of 2.433, and the p-value of

0.008. This indicates that the quality of complaint resolution not only increases satisfaction but also directly strengthens customer loyalty. When customers feel their complaints are handled well, their trust in the company increases, making them more likely to remain loyal to the service. These findings are consistent with research (Ahmed et al., 2020; Fadilah et al., 2023) explaining that effective complaint handling can strengthen customer loyalty both directly and through customer satisfaction.

Regarding the moderating variable, age was found to negatively and significantly moderate the effect of customer satisfaction on customer loyalty, with a coefficient of -0.332, the t-statistic of 3.957, and the p-value of 0.000. These results indicate that as customers' age increases, the effect of satisfaction on loyalty tends to weaken. Behaviorally, older customers may have more stable preferences, more experience, and other considerations beyond momentary satisfaction, so their loyalty is not entirely determined by satisfaction. This finding supports the view (Morgeson et al., 2020) that demographic characteristics such as age can influence the strength of the relationship between customer satisfaction and loyalty.

The results of the moderation analysis for education also showed a significant negative effect, with a coefficient of -0.157, the t-statistic of 1.700, and the p-value of 0.045. This indicates that higher levels of education tend to weaken the influence of satisfaction on customer loyalty. Customers with higher education generally have a more critical evaluation of service quality and more alternatives to compare against, so their loyalty is not influenced solely by satisfaction. These findings are also consistent with the customer characteristics approach in studies (Chikazhe et al., 2021; Morgeson et al., 2020) that identifies education as one of the demographic factors capable of strengthening or weakening the relationship between customer behavior.

Meanwhile, income was found to positively and significantly moderate the relationship between customer satisfaction and loyalty, with a coefficient of 0.173, the t-statistic of 2.144, and the p-value of 0.016. These results indicate that the higher a customer's income, the stronger the influence of satisfaction on customer loyalty. Customers with higher income levels tend to have more stable purchasing power and are better able to maintain service usage when they are satisfied. Thus, the satisfaction formed will be more easily translated into sustained loyalty. This finding supports the research (Chikazhe et al., 2021) which explains that customer economic characteristics, particularly income, can strengthen the relationship between satisfaction and loyalty.

Based on the results of the indirect hypothesis testing, it was found that customer satisfaction mediates the relationship between complaint handling and customer loyalty. This is indicated by the original sample value of 0.182, the t-statistic of 3.878, and the p-value of 0.000, which meets the significance criterion of p-value < 0.05. These findings indicate that the better a company handles complaints, the higher customer satisfaction will be, which ultimately fosters customer loyalty. In other words, customer loyalty is not only directly influenced by the quality of complaint handling but also by the satisfaction that arises after a customer's complaint is resolved effectively.

These findings are consistent with a study (Susanti, 2021) which states that satisfaction with complaint handling was found to mediate the effect of complaint handling on customer loyalty in the banking industry in Indonesia. Similar results are also supported by (Ahmed et al., 2020; Salim et al., 2018), who explain that customer loyalty is more strongly established when complaint handling first generates customer satisfaction. Thus, the results of this study further emphasize that customer satisfaction is a crucial mediating pathway in building customer loyalty through effective complaint handling.

CONCLUSION

This study concludes that complaint handling is a critical determinant of customer loyalty among Grab users in Indonesia, both directly and indirectly through customer satisfaction as a mediating mechanism. Complaint resolution that is timely, fair, responsive, and solution-oriented significantly enhances customer satisfaction, which subsequently strengthens customers' intention to continue using the service and to recommend it to others. Furthermore, customer characteristics, particularly age, education, and income, were found to moderate the relationship between satisfaction and loyalty, suggesting that the effectiveness of complaint-handling strategies differs across customer segments. Overall, these findings emphasize that a responsive, personalized, and customer-centric complaint management system serves not only as a service recovery mechanism but also as a strategic tool for sustaining long-term customer loyalty and reinforcing Grab's competitive position in the rapidly evolving online transportation industry.

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