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# The Effect of Facilities and Service Quality on Passenger Loyalty Through Passenger Satisfaction Using MRT (MASS Rapid Transit) Transportation Services

**Evi Herawati[1], Euis Saribanon[2], Cecep Pahrudin[3], Juliater Simarmata[4], Reni Dian Octaviani[5]**
[1]Institute of Transportation and Logistics Trisakti, Jakarta, Indonesia, eviherawati93@gmail.com
[2]Institute of Transportation and Logistics Trisakti, Jakarta, Indonesia, nengnonon04@gmail.com
[3]Institute of Transportation and Logistics Trisakti, Jakarta, Indonesia, c.pahrudin@yahoo.co.id
[4]Institute of Transportation and Logistics Trisakti, Jakarta, Indonesia, juliaters@itltrisakti.ac.id
[5]Institute of Transportation and Logistics Trisakti, Jakarta, Indonesia, reni@itltrisakti.ac.id

Corresponding Author: eviherawati93@gmail.com[1]

**Abstract:** Public transportation plays a vital role in urban mobility, especially in major cities like Jakarta. One of the modes of transportation expected to reduce congestion is the Mass Rapid Transit (MRT). Since its operation, MRT Jakarta has become a preferred alternative due to its speed and punctuality. This study aims to analyze the influence of facilities and service quality on usage loyalty through passenger satisfaction as a mediating variable. By understanding the relationship among these variables, this research seeks to provide strategic recommendations for MRT Jakarta management to improve service quality and retain user loyalty. The research method used is descriptive with a quantitative approach. The population of this study comprises all MRT users in Jakarta, totaling 33,496,540 (MRT, 2024). Based on Slovin's formula, a sample of 400 respondents was determined. Data were collected using both secondary data (journals, previous research, MRT data) and primary data through questionnaires. The analysis method employed is Structural Equation Modeling (SEM), a statistical technique used to build and test causal relationship models. The results indicate that both facilities and service quality have significant direct and indirect effects on usage loyalty, with passenger satisfaction serving as a crucial mediating factor.

**Keywords:** Mass Rapid Transport Jakarta, Facilities, Service Quality, Passenger Satisfaction, Passanger Loyalty, Public Transportation, Structural Equation Modeling.

## INTRODUCTION

Public transportation plays a vital role in urban mobility, particularly in major cities such as Jakarta. One of the transportation modes expected to alleviate traffic congestion in Jakarta is the Mass Rapid Transit (MRT). Since its operation began, MRT Jakarta has become a preferred mode of transportation due to its speed and punctuality. The loyalty of users toward public transportation services like MRT is influenced by various factors, including the facilities provided and the quality of service delivered.

However, although MRT Jakarta has been operating since 2019 and offers speed and time efficiency, several issues still affect service quality, facilities, and passenger satisfaction, which have led to a decline in passenger loyalty. The decrease in user loyalty is also reflected in MRT usage data, which shows a decline in passenger numbers from January 2024 to April 2024, as presented in Table 1. During this four-month period, a downward trend was observed, which may have been caused by inadequate service quality and facilities, resulting in an unsatisfactory experience for passengers. This lack of satisfaction may cause users to be reluctant to continue using the MRT in the long term.

**Table 1. Total MRT Passengers**

| Katergori | Total Penumpang |
|---|---|
| Januari | 3.133.700 |
| Februari | 2.595.293 |
| Maret | 2.876.356 |
| April | 2.607.904 |

Source: BPS (2024)

The facilities provided by MRT Jakarta, such as station comfort, train cleanliness, and accessibility for passengers with special needs, still face several challenges. A study by Pambudi & Hidayati, (2020) revealed that the lack of seating during peak hours, suboptimal ventilation, and limited parking facilities were among the main complaints of passengers. These issues not only reduce comfort but also potentially affect passengers' willingness to repeatedly use MRT services.

Passenger satisfaction with MRT Jakarta is influenced by their overall experience while using the service. However, a survey conducted by a transportation research institution in 2023 indicated that passenger satisfaction levels remain moderate, with certain aspects such as train waiting time and station area safety being the main sources of dissatisfaction. This decline in satisfaction may influence public perceptions of MRT as a reliable mode of transportation. Passenger satisfaction is heavily determined by user experience throughout the journey. Problems such as long queues at passenger gates, the misuse of elevators and priority seats by non-priority passengers, and disorderly queueing behavior indicate a lack of effective crowd control management.

According to a study by Agustina & Rahmah, (2022), the level of negative sentiment toward MRT Jakarta is relatively high, primarily due to poor service quality. Approximately 22.4% of the sentiment expressed toward MRT was categorized as negative.

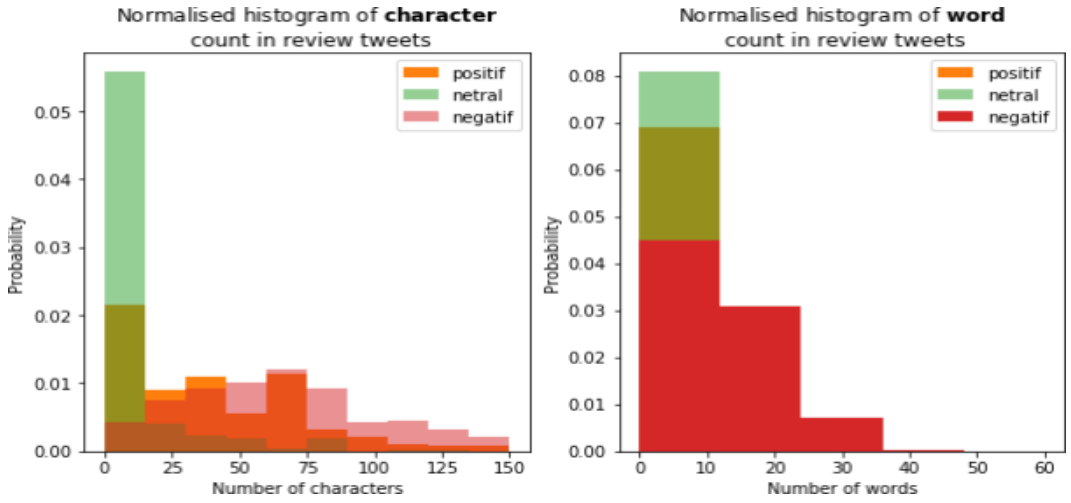



**Figure 1. MRT Sentiment**
Source: Agustina & Rahmah, (2022)

Previous studies have shown that facilities and service quality have a significant influence on the decision to use MRT Jakarta's transportation services. Research by Fatoni and Hardianti (2020) found that both facilities and service quality, whether partially or simultaneously, significantly affect passengers' decisions to use MRT Jakarta, contributing up to 86.1% (Rahmasari et al., 2023).

These findings suggest that dissatisfaction with MRT Jakarta's services and facilities may encourage passengers to switch to alternative modes of transportation. Based on this background, this study aims to analyze the influence of facilities and service quality on MRT usage loyalty, with passenger satisfaction serving as a mediating variable. By understanding the relationships among these variables, this research is expected to provide strategic recommendations for MRT Jakarta management to improve service quality and sustain user loyalty (Sandy Ricky Kurniawan, Selfiana, 2024).

## METHOD

This study employs a quantitative approach with an explanatory research design, aiming to explain the causal relationship between independent and dependent variables through statistical analysis. This approach was chosen because it enables the empirical examination and illustration of the influence of Facilities (X1) and Service Quality (X2) on Passanger Loyalty (Y), with Passenger Satisfaction (Z) serving as the intervening variable. Through this approach, the researcher seeks to identify the extent to which the provided facilities and service quality affect passenger satisfaction and loyalty among users of modern public transportation services, specifically MRT Jakarta.

The research was conducted at MRT Jakarta, which is Indonesia's first rail-based mass transportation system operating within the DKI Jakarta area. The selection of this location is based on its role as an urban transportation mode that prioritizes speed, efficiency, and comfort, yet continues to face challenges related to user satisfaction and loyalty. The population in this study consists of all active MRT Jakarta passengers who have used the service at least twice in the past month. Considering that MRT users represent a broad and heterogeneous population, this research applies a non-probability sampling method using purposive sampling, in which respondents are selected based on specific criteria relevant to the study's objectives.

A total of 400 respondents were selected as the research sample. The sample size was determined using the Slovin formula. This sampling process is expected to represent the general characteristics of MRT users in terms of usage frequency, occupational background, and travel purpose.

The data used in this study comprise both primary and secondary data. Primary data were collected through the distribution of closed-ended questionnaires using a five-point Likert scale (1–5) to measure respondents' perceptions of the variables: facilities, service quality, satisfaction, and loyalty. The questionnaires were distributed both directly at several major MRT stations and online via Google Forms. Meanwhile, secondary data were obtained from official sources such as MRT Jakarta's annual reports, publications from the Jakarta Provincial Transportation Agency, and various academic literature and international journals supporting the analysis of the relationships among the study variables.

Data analysis was carried out using the Structural Equation Modeling (SEM) method with the Partial Least Squares (PLS) approach through SmartPLS software version 4.1. This method was chosen for its ability to simultaneously analyze causal relationships among latent variables, including mediating variables, even with a relatively small sample size. The analysis was conducted in two main stages: (1) the measurement model (outer model) to test the validity and reliability of the research instruments, and (2) the structural model (inner

model) to test the relationships among variables based on R-square, f-square, Q-square values, and hypothesis testing using p-values and t-statistics at a 5% significance level.

This research was conducted over a twelve-month period, beginning with the preparation and instrument design phase from January to April 2025, field data collection from May to June 2025, data processing and analysis from July to August 2025, interpretation of results and discussion from September to October 2025, and the final report writing and revision stage from November to December 2025.

## RESULTS AND DISCUSSION

The measurement model testing in this study was conducted to ensure that the variables Facilities (X1) and Service Quality (X2), Passenger Satisfaction (Z), and Passanger Loyalty (Y) were measured with both validity and reliability. Validity was assessed through convergent validity and discriminant validity. Convergent validity was confirmed when the Average Variance Extracted (AVE) values were ≥ 0.50, indicating that the indicators adequately represented their respective constructs. Discriminant validity was evaluated by comparing the square root of the AVE for each construct with the correlations between constructs, ensuring that every variable is conceptually distinct and measures a unique dimension of the terminal performance model. Reliability was tested using Composite Reliability (CR), with a threshold value of ≥ 0.70, to confirm the internal consistency of indicators within each construct. This indicates that the measurement items of each variable such as distance to transport networks, connectivity to economic centers, consistency of terminal services, and operational safety were stable and cohesive in measuring their intended dimensions.

### Validity Test Result

Convergent validity testing was conducted using SmartPLS 4 with the Partial Least Squares (PLS) algorithm approach. An indicator is considered valid if it has a loading factor value of ≥ 0.70, indicating that the indicator strongly represents the measured construct.

**Table 1. Results of Validity Testing**

| Variable | Indicators | Loading Factors | Description |
|---|---|---|---|
| **Facilities (X1)** | X1.1 | 0.898 | Valid |
| | X1.2 | 0.908 | |
| | X1.3 | 0.862 | |
| | X1.4 | 0.885 | |
| | X1.5 | 0.889 | |
| | X1.6 | 0.842 | |
| | X1.7 | 0.860 | |
| | X1.8 | 0.888 | |
| | X1.9 | 0.868 | |
| | X1.10 | 0.842 | |
| | X1.11 | 0.843 | |
| **Service Quality (X2)** | X2.1 | 0.864 | Valid |
| | X2.2 | 0.856 | |
| | X2.3 | 0.862 | |
| | X2.4 | 0.893 | |
| | X2.5 | 0.842 | |
| | X2.6 | 0.798 | |
| | X2.7 | 0.864 | |

| | | | |
|---|---|---|---|
| | X2.8 | 0.840 | |
| | X2.9 | 0.761 | |
| | X2.10 | 0.805 | |
| | X2.11 | 0.794 | |
| | X2.12 | 0.859 | |
| | X2.13 | 0.849 | |
| | X2.14 | 0.812 | |
| | X2.15 | 0.727 | |
| **Passenger Satisfaction (Z)** | Z1 | 0.877 | Valid |
| | Z2 | 0.874 | |
| | Z3 | 0.855 | |
| | Z4 | 0.840 | |
| | Z5 | 0.846 | |
| | Z6 | 0.866 | |
| **Passanger Loyalty (Y)** | Y1 | 0.823 | Valid |
| | Y2 | 0.784 | |
| | Y3 | 0.849 | |
| | Y4 | 0.870 | |
| | Y5 | 0.860 | |
| | Y6 | 0.837 | |
| | Y7 | 0.860 | |
| | Y8 | 0.876 | |
| | Y9 | 0.881 | |

Source: Research data

Based on the validity test results presented in Table 4.1, the loading factor values for each indicator in the study variables demonstrate a strong relationship with their respective latent constructs, thereby fulfilling the criteria for convergent validity. According to Slamet and Wahyuningsih (2022), an indicator is considered valid if it has a loading factor value greater than 0.50. All indicators in this study exceed this threshold, with most showing values above 0.80, indicating a very high level of validity.

The Facility variable (X1) consists of eleven indicators (X1.1–X1.11) with loading factor values ranging from 0.842 to 0.908. These high values indicate that all indicators are strongly correlated with the latent construct of facilities. Thus, all measurement items for the facility variable are declared valid and consistently represent the measured concept.

The Service Quality variable (X2) is measured through fifteen indicators (X2.1–X2.15), with loading factor values ranging from 0.727 to 0.893. Although there are variations among indicators, all values exceed 0.70, which means that all indicators effectively explain the service quality variable. These results show that each dimension of service—covering reliability, responsiveness, empathy, and staff attentiveness—contributes significantly to representing the overall perception of service quality.

Furthermore, the Passenger Satisfaction variable (Z) comprises six indicators (Z1–Z6) with loading factor values between 0.840 and 0.877. All indicators exhibit a very strong correlation with the latent construct of passenger satisfaction, indicating that the measurement instrument used to assess satisfaction levels has met the criteria for convergent validity and can be reliably used for further analysis.

The User Loyalty variable (Y) is measured through nine indicators (Y1–Y9), with loading factor values ranging from 0.784 to 0.881. These values demonstrate that all

indicators have a high representational strength toward the loyalty construct, reflecting consistent user behavior in terms of reuse intention, retention, and recommendation to others.

Overall, the test results confirm that all variables in this study meet the requirements for convergent validity, with all indicators exhibiting loading factor values above 0.70. This finding proves that each indicator serves as a valid and reliable measure of its respective latent construct, thereby indicating that the measurement model (outer model) in this study is robust and suitable to proceed to the structural analysis stage (inner model).

## Reliability Test Result

Reliability testing evaluates the internal consistency of the research instrument to ensure stability and trustworthiness in repeated measurements (Taherdoost, 2018). This study employs Cronbach's Alpha and Composite Reliability as the main indicators. A construct is considered reliable if Cronbach's Alpha > 0.6 (exploratory) or > 0.7 (confirmatory), and Composite Reliability > 0.7 (Ghozali, 2016). The results of both indicators are presented as follows.

**Table 2. Results of Reability Testing**

| | Cronbach's alpha | Composite reliability (rho_c) |
|---|---|---|
| **Terminal Location (X1)** | 0.899 | 0.930 |
| **Accessibility (X2)** | 0.917 | 0.941 |
| **Service Reliability (Z)** | 0.904 | 0.933 |
| **Safety and Security (Y)** | 0.839 | 0.903 |

Source: Research data

Based on the reliability test results presented in Table 4.2, all constructs in this study Facilities (X1) and Service Quality (X2), Passenger Satisfaction (Z), and Passanger Loyalty (Y) have Cronbach's Alpha and Composite Reliability values exceeding 0.70. These results indicate that each construct demonstrates high internal consistency, meaning that all indicators within the same variable are correlated and consistently measure the intended latent construct.

Therefore, it can be concluded that the measurement instruments used in this study are reliable and appropriate for further analysis, ensuring the robustness of the measurement model in capturing the relationship between terminal location, accessibility, service reliability, and safety within the logistics terminal context.

## $R^2$ Test Result

The coefficient of determination ($R^2$) represents the proportion of variance in the dependent variable that can be explained by the independent variables within the model. According to Hair et al. (Hair et al., 2014), $R^2$ is derived by squaring the correlation coefficient. To assess the explanatory power of the model, the $R^2$ value can be interpreted as follows: a value above 0.67 indicates a strong level of explanatory power, a value between 0.33 and 0.67 reflects a moderate level, while a value between 0.19 and 0.33 suggests a weak level of influence. The following model summary table presents the $R^2$ values for each dependent construct in the study.

**Table 3. Results of Coefficient of Determination ($R^2$)**

| Variable | R-square | R-square adjusted | Result |
|---|---|---|---|
| Passenger Loyalty (Y) | 0.596 | 0.593 | Moderate |
| Passenger Satisfaction (Z) | 0.557 | 0.555 | Moderate |

Source: Research data

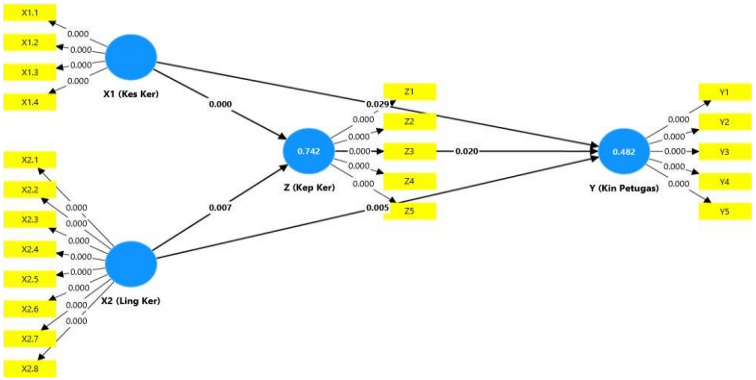
Based on Table 4.3, the test results indicate that the Passenger Loyalty (Y) variable has an R-Square value of 0.596 and an Adjusted R-Square value of 0.593, which falls within the moderate category. This means that 59.6% of the variance in passenger loyalty can be explained by the variables of facilities, service quality, and passenger satisfaction, while the remaining 40.4% is influenced by other factors outside the research model. Furthermore, the Passenger Satisfaction (Z) variable has an R-Square value of 0.557 and an Adjusted R-Square value of 0.555, which also belongs to the moderate category. This indicates that 55.7% of the variance in passenger satisfaction can be explained by the variables of facilities and service quality, while the remaining 44.3% is accounted for by other factors outside the model.

Overall, these results demonstrate that the research model possesses a moderate level of explanatory power, implying that the structural model used in this study is sufficiently robust in explaining the relationships among the variables—namely, facilities, service quality, passenger satisfaction, and user loyalty toward MRT Jakarta's services.

## Hypothesis Testing Result

This section outlines the final stage of analysis, which involves evaluating the regression coefficients to examine the significance of relationships between variables. Hypothesis testing is conducted at a 5% significance level, where a hypothesis is accepted if the t-statistic exceeds 1.980 and the p-value is below 0.05 (Hair et al., 2014). A significant regression coefficient indicates a meaningful relationship between the tested variables, thereby supporting the proposed hypothesis.

The hypothesis testing results were obtained through data analysis using Partial Least Squares (PLS) with SmartPLS version 4.1.0.0. The output of this analysis is visualized in the path diagram shown in Figure 4.2, which illustrates the relationships among variables as evaluated through the PLS approach.




Source: Research data

**Figure 2. Path Diagram**

The table below presents the regression coefficient values for each independent variable in relation to the respective dependent variable being tested.

**Table 4. Results of Direct Hypothesis Testing**

| Hypothesis | Path | Original sample (O) | T statistics | P values | Result |
|---|---|---|---|---|---|
| H1 | The Influence of MRT Facilities on Passenger Satisfaction. | 0.376 | 7.601 | 0.000 | Accepted / supported |
| H2 | The Influence of Service Quality on Passenger Satisfaction. | 0.442 | 8.886 | 0.000 | Accepted / supported |

| | | | | | |
|---|---|---|---|---|---|
| H3 | The Influence of MRT Facilities on Passenger Loyalty | 0.435 | 7.286 | 0.000 | Accepted / supported |
| H4 | The Influence of Service Quality on Passenger Loyalty | 0.268 | 4.162 | 0.000 | Accepted / supported |
| H5 | The Influence of Passenger Satisfaction on Passenger Loyalty | 0.163 | 2.609 | 0.009 | Accepted / supported |

Source: Research data

**Hypothesis 1**

The test results show that facilities have a positive and significant influence on passenger satisfaction, with an original sample (O) value of 0.376, a t-statistic of 7.601, and a p-value of 0.000 (< 0.05). This indicates that the better the facilities provided by MRT, the higher the level of passenger satisfaction.

This finding supports the theory proposed by Kotler, as cited in Azzahra et al., (2025) which states that the condition, completeness, and design of facilities play a crucial role in shaping users' perceptions and comfort. Clean, safe, modern, and accessible facilities enhance passengers' positive experiences. Therefore, MRT Jakarta should continue improving the quality of its facilities such as waiting areas, lighting, digital information systems, and accessibility for persons with disabilities to maintain passenger satisfaction.

**Hypothesis 2**

Service quality has a positive and significant effect on passenger satisfaction, with an original sample (O) value of 0.442, a t-statistic of 8.886, and a p-value of 0.000. This result indicates that the higher the quality of service provided, the greater the level of passenger satisfaction.

This finding aligns with the SERVQUAL theory developed by Budiman & Fadhilah, (2023), which emphasizes that the dimensions of reliability, responsiveness, empathy, and assurance are key determinants of customer satisfaction. In the context of MRT Jakarta, factors such as staff friendliness, punctuality, and ease of accessing travel information play vital roles. Therefore, continuous improvement in staff competence and the integration of digital services such as real-time arrival information are necessary to strengthen user satisfaction.

**Hypothesis 3**

The test results indicate that facilities have a positive and significant influence on passenger loyalty, with an original sample (O) value of 0.435, a t-statistic of 7.286, and a p-value of 0.000. This means that the better the facilities provided, the stronger the passengers' tendency to continue using MRT services. This result reinforces the findings of Hidayati et al., (2022), who stated that the comfort and completeness of public facilities are key factors in driving user loyalty. Facilities not only provide functional comfort but also create emotional experiences that foster attachment to the service. Therefore, MRT management could consider innovative facility improvements, such as co-working areas, comfortable resting spaces, or loyalty-based membership programs, to retain loyal users.

**Hypothesis 4**

Service quality is proven to have a positive and significant influence on passenger loyalty, with an original sample (O) value of 0.268, a t-statistic of 4.162, and a p-value of 0.000. This finding shows that excellent service not only increases satisfaction but also fosters long-term loyalty. Passengers who feel well-served tend to reuse MRT services and recommend them to others. This finding is consistent with the study by Deliyani & Prambudi,

(2020), which emphasized that service personalization and response speed are key factors in shaping loyalty in the digital era. Therefore, MRT Jakarta is advised to expand its digital service implementation, such as mobile applications for ticket purchases, schedule tracking, and automated feedback systems, to strengthen customer loyalty.

**Hypothesis 5**

The passenger satisfaction variable is proven to have a positive and significant influence on user loyalty, with an original sample (O) value of 0.163, a t-statistic of 2.609, and a p-value of 0.009. Although its coefficient value is lower compared to other variables, the result still indicates that satisfaction plays a crucial role in shaping loyalty. This finding supports (Isnanto & Saputro, 2024) theory, which posits that satisfaction is a prerequisite for customer loyalty. Satisfied passengers are more likely to reuse the service and provide positive recommendations to others. In the context of MRT Jakarta, consistent experiences that meet expectations from facility comfort to service reliability will strengthen users' intention to remain loyal and continue choosing MRT as their primary mode of public transportation.

**Table 5. Results of Indirect Hypothesis Testing**

| Hypothesis | Path | Original sample (O) | T statistics | P values | Result |
|---|---|---|---|---|---|
| H6 | MRT Facilities through Passenger Satisfaction have an influence on Passanger Loyalty. | 0.061 | 2.362 | 0.018 | Accepted / supported. |
| H7 | Service Quality through Passenger Satisfaction has an influence on Passanger Loyalty. | 0.072 | 2.579 | 0.010 | Accepted / supported. |

Source: Research data

**Hypothesis 6**

The test results show that facilities have a positive and significant indirect effect on passenger loyalty through satisfaction, with an original sample (O) value of 0.061, a t-statistic of 2.362, and a p-value of 0.018 (< 0.05). This indicates that improving the quality of facilities can enhance passenger satisfaction, which in turn leads to increased loyalty toward MRT services.

This finding supports the study by Widyaningrum, (2020), which stated that public facilities play an important role in creating satisfaction, which subsequently influences customer loyalty. In the context of public transportation services, passenger satisfaction serves as a mediating element linking the experience with facilities to the decision to continue using the service repeatedly. In other words, passengers who are satisfied with the facilities provided are more likely to remain loyal to MRT Jakarta. Therefore, improving the quality and comfort of facilities such as waiting areas, cleanliness, lighting, and accessibility for all groups—becomes a strategic factor in maintaining user loyalty.

**Hypothesis 7**

The test results show that service quality has a positive and significant indirect effect on user loyalty through passenger satisfaction, with an original sample (O) value of 0.072, a t-statistic of 2.579, and a p-value of 0.010 (< 0.05). This indicates that improvements in service quality first shape passenger satisfaction, which in turn enhances their loyalty to MRT services.

This finding is consistent with the study by Wang et al. (2023), which emphasizes that customer satisfaction is a crucial mediating variable between service quality and loyalty. Fast,

friendly, and technology based services create positive perceptions that enhance customer experience and strengthen emotional attachment to the service. In the context of MRT Jakarta, the implementation of service digitalization—such as real-time travel information, queue-free ticket purchase applications, and easy customer complaint systems—represents a tangible form of service quality improvement that ultimately fosters long-term loyalty..

## CONCLUSION

The findings of this study comprehensively demonstrate that both facilities and service quality play a pivotal role in shaping passenger satisfaction and loyalty toward MRT Jakarta. The quantitative analysis reveals that facilities and service quality exert significant direct and indirect effects on user loyalty, with passenger satisfaction functioning as a mediating variable.

First, the results confirm that well-maintained, comfortable, and accessible facilities significantly enhance passenger satisfaction. Modern and clean infrastructure—such as waiting areas, lighting, cleanliness, and accessibility features for all users—creates a positive user experience that contributes to stronger attachment to MRT services. Likewise, high-quality services characterized by responsiveness, reliability, empathy, and professionalism have been proven to increase not only passenger satisfaction but also long-term loyalty. Friendly and competent staff, punctual operations, and easy access to accurate information all strengthen users' trust and satisfaction with the service.

Furthermore, the mediating role of passenger satisfaction provides empirical evidence that satisfaction acts as a bridge between the quality of facilities and services with user loyalty. Passengers who feel satisfied with their overall experience are more likely to continue using MRT Jakarta and to recommend it to others. This finding underscores the importance of maintaining high service standards and continuous facility improvement to ensure long-term customer retention.

Overall, the structural model used in this research shows a moderate yet robust explanatory power, indicating that the relationships among facilities, service quality, passenger satisfaction, and user loyalty are well-established. The study concludes that sustainable efforts in enhancing both tangible (facilities) and intangible (service quality) aspects will significantly strengthen passenger satisfaction and foster enduring loyalty toward MRT Jakarta as a reliable and modern mode of urban public transportation.

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