

Analysis of Reuse Intention in Sustainable Mass Transportation: Teman Bus Mamminasata in Makassar City

Saskia Ramadhani¹, Kifayah Amar²,
Diniary Ikarasi S^{3,*}

¹Hasanuddin University, Makassar, South Sulawesi

²Hasanuddin University, Makassar, South Sulawesi

³Hasanuddin University, Makassar, South Sulawesi

Email: skrmdhn@gmail.com (korespondensi)

This study aims to determine the influence of service quality, customer value, and environmental concern on reuse intention, with customer satisfaction as an intervening variable among users of the Teman Bus (Trans Mamminasata) service in Makassar City. This research adopts a quantitative approach by distributing online questionnaires to 333 passengers who use the Teman Bus Trans Mamminasata service in Makassar City. Data analysis is conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method. The results show that service quality, customer value, environmental concern, and customer satisfaction have a direct positive, and significant impact on reuse intention. Service quality and customer value also have a direct, positive, and significant influence on customer satisfaction. Furthermore, service quality and customer value indirectly affect reuse intention with customer satisfaction as the intervening variable. Therefore, the company must continuously enhance customer satisfaction by building positive experiences for passengers to increase their intention to reuse the Teman Bus service.

Keywords: Service Quality, Customer Value, Environment Concern, Reuse Intention Customer Satisfaction, PLS-SEM

Introduction

Among various modes of transportation, land transportation is one of the most common modes due to its convenience and ease of travel, which leads to its continuous growth over the years. Based on data from the Central Statistics Agency (Badan Pusat Statistik) indicating an increase in the number of motorized vehicles in the past five years, from 2016 to 2020, with an average annual increase of 5% (BPS, 2023). On the other hand, the growth in the number of vehicles is not accompanied by sufficient road infrastructure, leading to traffic congestion (Kevin et al., 2022).

The growth of the transportation sector has had impacts such as environmental damage and air pollution. This is caused by the increased use of fossil fuels in the transportation sector, resulting in increased exhaust emissions containing pollutants, which contribute to the rise in surface temperature of the Earth and can cause global warming (Basuki and Liani, 2018). Additionally, this growth has contributed to worsening traffic congestion.

The South Sulawesi Provincial Government has initiated Teman Bus Mamminasata Program as a customer-oriented transportation solution that integrates various elements such as bus stops, planning, vehicles, and the transportation system. This program aims to create an integrated bus system that provides comfort, safety, punctuality, and implements the Buy the Service program as part of a sustainable mass transportation solution. Teman Bus Mamminasata, which began operating in November 2021, initially implemented a fare-free policy during its trial phase. However, as of November 2022, Teman Bus Mamminasata has officially implemented fares for all routes. This fare implementation has resulted in a

drastic decrease in the number of passengers, up to 45 percent. This indicates that the public's intention to reuse Teman Bus Mamminasata service has not been aligned with the policy of public transportation.

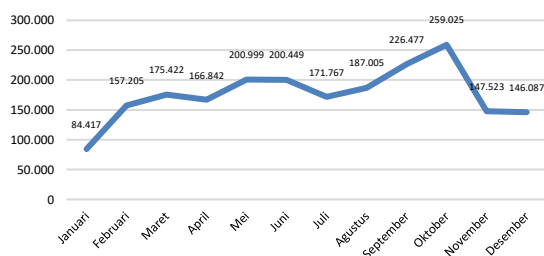


Figure 1. Number of Passengers of Mamminasata Bus Companion in Makassar City in 2022

Based on the description above, the main objective of this study is to determine the main factors underlying the behavior of public transportation passengers in reusing Teman Bus Mamminasata service. This study aims to investigate the influence of service quality, customer value, and environmental concern on reuse intention, with customer satisfaction as the intervening variable among users of Teman Bus Mamminasata service in Makassar City.

Service Quality

Service quality refers to the provision of services that meet customers' expectations (Reeves & Bednar, 1994). Parasuraman et al. (1988) have defined service quality as the difference between customers' expectations of the service they desire and their perceptions of the actual service they receive.

Customer Value

Customer value can be defined as the difference between the benefits received by customers in owning and using a product and the costs incurred to obtain that product (Kotler & Armstrong, 2001).

Environment Concern

Junior et al. (2018) cited in Firmansyah (2021) state that environmental concern refers to individual actions aimed at protecting or enhancing environmental quality, reducing energy and natural resource consumption, and reducing or eliminating the use of pollutants and toxic waste.

Customer Satisfaction

According to Petrick (2004), customer satisfaction is closely related to perceived service quality and value, and is widely considered a major driver of public transportation consumer loyalty.

Reuse Intention

According to Schaupp (2010), it can be defined as an individual's tendency or intention to reuse a previously used item or product. This includes the extent to which users have a desire or intent to reuse the item.

Partial Least Square SEM

According to Fornell and Bookstein (1982) cited in Widjaya (2020), Partial Least Squares (PLS) is a powerful analysis method that is not based on many assumptions. PLS aims to develop or build theories and determine the main determinants, and it can also be used to explain the presence or absence of relationships between variables.

Method

Data collection was conducted through a survey using a questionnaire instrument. Secondary and primary data were collected in May 2023 in the cities of Makassar and the districts of Gowa, Takalar, and Maros in South Sulawesi Province. The data analysis used in this study is the partial least square structural equation model, and the data processing was performed using SmartPLS version 3.2.9. According to the SEM method, the calculation of the required number of questionnaires or respondents is based on 5 times the number of indicators or constructs in the structural model (Hair et al., 2017). In this study, there are 26 indicators, so at least 130 samples should be obtained. The number of respondents used in this study is 333 people, which satisfies the minimum sample requirement.

Results/Analysis

Company Overview

Teman Bus Mamminasata is the realization of the Buy The Service program, which aims to provide a sustainable mass transportation solution and has been in operation in Makassar since November 16, 2021. This program is supported by the Ministry of Transportation of the Republic of Indonesia and is intended to develop road-based public transportation in urban areas by utilizing reliable telematics technology and non-cash payment systems. The main objective is to improve

safety, security, and comfort in the mobility process (Aksa et al., 2022).

Outer Model Evaluation

1. Convergent Validity

Convergent validity is the testing of the convergent validity of each construct's indicators. According to Chin in Ghozali (2014), an indicator is considered to have good validity if its loading factor is greater than 0.70, while loading factors between 0.50 and 0.60 can be considered acceptable as long as construct validity and reliability meet the criteria. Based on this criterion, if there are loading factors below 0.50, they will be removed or excluded from the model, or it can be said that those loading factors will be ignored as long as the AVE value is above (> 0.50) and considered valid. The following presents the results of the convergent validity test.

Table 1. Outer Loading Model Results

Measurement Model	Result	Critical Value	Model Evaluation
Outer Model			
	<i>Outer Loading</i>		
	SQ1	0,614	Valid
	SQ2	0,702	Valid
	SQ3	0,773	Valid
	SQ4	0,831	Valid
	SQ5	0,784	Valid
	SQ6	0,737	Valid
	SQ7	0,779	Valid
	SQ8	0,727	Valid
	SQ9	0,789	Valid
	SQ10	0,657	Valid
	SQ11	0,798	Valid
	SQ12	0,725	Valid
Convergent Validity	CV1	0,896	Valid
	CV2	0,895	Valid
	CV3	0,858	Valid
	EC1	0,840	Valid
	EC2	0,857	Valid
	EC3	0,883	Valid
	EC4	0,836	Valid
	CS1	0,902	Valid
	CS2	0,911	Valid
	CS3	0,918	Valid
	RI1	0,912	Valid
	RI2	0,915	Valid
	RI3	0,904	Valid
	RI4	0,872	Valid

Table 2. Convergent Validity Model Results

Measurement Model	Result	Critical Value	Model Evaluation
Outer Model			
	Variable	AVE	
	CS	0,828	Valid
Convergent Validity	CV	0,780	Valid
	EC	0,730	Valid
	RI	0,812	Valid
	SQ	0,556	Valid

Based on the table above, it can be observed that the outer loading values of all indicators for each

variable are > 0.5, and the AVE values are > 0.5, indicating that they meet the criteria. Therefore, it can be concluded that all variables are valid and meet the convergent validity.

2. Discriminant Validity

Discriminant validity testing evaluates the reflective indicators through cross-loadings between the indicators and their constructs. An indicator can be considered valid if its loading factor is highest on the intended construct compared to the loading factors on other constructs. Thus, latent constructs can better predict a specific block's measurement than other blocks' measurements (Imaningsih & Fathonah, 2018). The following is the result of the discriminant validity testing:

Table 3. Discriminant Validity Test Results

Indicator	CS	CV	EC	RI	SQ
CS1	0,902	0,768	0,721	0,771	0,757
CS2	0,911	0,747	0,618	0,725	0,753
CS3	0,918	0,752	0,705	0,792	0,752
CV1	0,743	0,896	0,682	0,727	0,742
CV2	0,766	0,895	0,654	0,724	0,725
CV3	0,688	0,858	0,626	0,646	0,701
EC1	0,621	0,652	0,840	0,587	0,628
EC2	0,623	0,608	0,857	0,603	0,589
EC3	0,668	0,657	0,883	0,647	0,621
EC4	0,645	0,616	0,836	0,672	0,636
RI1	0,762	0,735	0,681	0,912	0,698
RI2	0,745	0,719	0,649	0,915	0,729
RI3	0,730	0,679	0,662	0,904	0,667
RI4	0,781	0,721	0,661	0,872	0,701
SQ1	0,470	0,493	0,450	0,471	0,614
SQ10	0,540	0,523	0,413	0,504	0,657
SQ11	0,688	0,699	0,593	0,623	0,798
SQ12	0,649	0,607	0,491	0,611	0,725
SQ2	0,604	0,595	0,538	0,589	0,702
SQ3	0,637	0,585	0,530	0,571	0,773
SQ4	0,708	0,684	0,614	0,659	0,831
SQ5	0,678	0,648	0,552	0,589	0,784
SQ6	0,620	0,644	0,619	0,587	0,737
SQ7	0,602	0,644	0,569	0,548	0,779
SQ8	0,592	0,565	0,554	0,576	0,727
SQ9	0,582	0,603	0,530	0,586	0,789

Based on the discriminant validity testing using cross-loadings, it can be observed that in each variable column (bolded), the values are the highest compared to the cross-loadings of other variables, indicating that each item within each variable meets the criteria for discriminant validity.

3. Composite Reliability

This test is used to evaluate the instrument's reliability in a research model. The success of constructs, indicating good reliability or consistent use of the questionnaire as a research tool, is achieved when all composite reliability and Cronbach's alpha values for the variables are > 0.70 (Hair et al., 2017). The following are the results of the construct's reliability test for the variables in this study:

Table 4. Composite Reliability Model Test Results

Variable	Composite Reliability	Critical Value	Model Evaluation
Customer Satisfaction	0,935	> 0,70	Reliable
Customer Value	0,914		Reliable
Environment Concern	0,915		Reliable
Reuse Intention	0,945		Reliable
Service Quality	0,937		Reliable

Table 5. Cronbach's Alpha Test Results

Variable	Cronbach's Alpha	Critical Value	Model Evaluation
Customer Satisfaction	0,896	> 0,70	Reliable
Customer Value	0,859		Reliable
Environment Concern	0,877		Reliable
Reuse Intention	0,922		Reliable
Service Quality	0,926		Reliable

Using the composite reliability and Cronbach's alpha values, the test values meet the criteria with values > 0.70, indicating that each variable meets the tested construct's reliability.

Inner Model Evaluation

1. Coefficient of Determination (R-Square)

The R² value of latent variables indicates how much the endogenous variable can be explained by the exogenous variable. According to Chin (1998), the R² values are categorized as substantial (0.67), moderate (0.33), and weak (0.19).

Table 6. R² Model Results

Variable	R Square
Customer Satisfaction	0,757
Reuse Intention	0,750

It can be concluded that 75.7% of the construct's CS validity can be explained or influenced by the SQ and CV constructs, while the remaining 24.3% is influenced or explained by other variables not included in the research model. Furthermore, 75% of the construct's RI validity can be explained or influenced by the SQ, CV, EC, and CS constructs, while the remaining 25% is explained by other variables not included in the research model.

2. Predictive Relevance (Q-Square)

Predictive Relevance (Q-Square) Q² is a measure used to evaluate the extent to which the structural model produces good and accurate parameter estimates. If the Q² value is greater than 0 (zero), the model has significant predictive relevance (Imaningsih & Fathonah, 2018).

The Q-Square value can also be determined using the following formula:

$$Q^2 = 1 - (1 - R_1^2) \times (1 - R_2^2)$$

$$Q^2 = 1 - (1 - 0,757) \times (1 - 0,750)$$

$$Q^2 = 1 - (0,061)$$

$$Q^2 = 0,939$$

From the calculation results, a value greater than 0 was obtained, indicating that the built model has significant predictive relevance. Thus, the model is capable of explaining the information contained in the study with a success rate of 93.9%.

3. Goodness of Fit

Goodness of Fit (GoF) is used to measure the overall fit of the model to the observed data. In PLS-SEM, the Goodness of Fit value must be manually calculated using a formula that describes three categories of interpretation, namely GoF = 0.1 (low), GoF = 0.25 (medium), and GoF = 0.36 (high) (Maryani et al., 2020).

$$GoF = \sqrt{AVE \times R^2}$$

$$GoF = \sqrt{\frac{(0,828+0,780+0,730+0,812+0,556)}{5} + \frac{(0,757+0,750)}{2}}$$

$$GoF = 0,747$$

From the calculation results, a value of 0.747 > 0 was obtained, indicating that the model meets the criteria for a good instrument.

Hypothesis Testing

The estimated values of the path relationships in the structural model must be significant. This significance value can be obtained through bootstrap procedures using 5000 replications. The output generated from this procedure can be seen in the figure below.

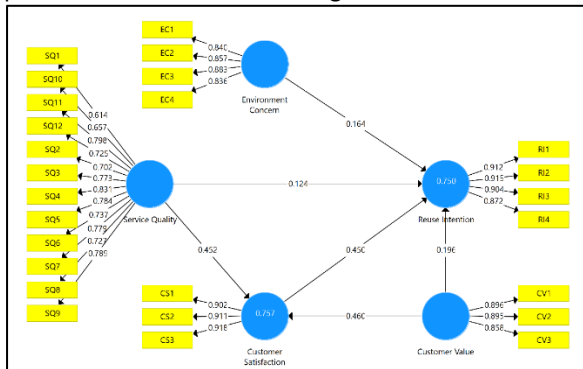


Figure 2. Results of Structural Model Bootstrapping

To evaluate the significance of the hypotheses, the parameter coefficient values and the significance values of T-statistics in the bootstrap algorithm report need to be considered. To determine significance, these significance values are compared with critical values in the t-table at a significance level of 0.05 (5%), which is equivalent to a critical value of 1.96. If the T-statistic significance value is greater than 1.96, the hypothesis is considered significant (Abdillah & Hartono, 2015).

Table 7. Evaluation of T-Statistics and Model Probability Test Results

Hypothesis	Path Coefficient	T Statistics	P Values	Evaluation
H ₁ : SQ → CS	0,452	7,412	0,000	Accepted
H ₂ : SQ → RI	0,327	4,325	0,000	Accepted

Hypothesis	Path Coefficient	T Statistics	P Values	Evaluation
H ₃ : CV → CS	0,460	7,390	0,000	Accepted
H ₄ : CV → RI	0,196	2,377	0,017	Accepted
H ₅ : CS → RI	0,450	5,676	0,000	Accepted
H ₆ : EC → RI	0,164	2,557	0,011	Accepted
H ₇ : SQ → CS → RI	0,207	4,335	0,000	Accepted
H ₈ : CV → CS → RI	0,204	4,582	0,000	Accepted

The positive and significant influence of Service Quality on Customer Satisfaction is confirmed in this study. This finding is consistent with previous research by Wang et al. (2020), which also indicates that service quality has a direct positive impact on customer satisfaction.

The positive and significant influence of Customer Value on Customer Satisfaction is supported by the findings of this study. This finding is consistent with previous research by Cheng et al. (2018) and Husein and Hapsari (2014), which show that customer perceived value has a positive and significant impact on customer satisfaction.

The positive and significant influence of Customer Value on Reuse Intention is also confirmed in this study. This finding is consistent with previous research by Prodanova et al. (2019) and Kim et al. (2019), who found that customer perceived value has a positive and significant impact on the intention to reuse.

The positive and significant influence of Customer Satisfaction on Reuse Intention is supported by the findings of this study. This finding is consistent with previous research by Wang et al. (2020), Kevin et al. (2022), and de Oña (2021), who found that customer satisfaction has a positive and significant impact on the intention to reuse.

The positive and significant influence of Environment Concern on Reuse Intention is also confirmed in this study. This finding is consistent with previous research by Novika et al. (2022), who found that environmental concern has a positive and significant impact on the intention to reuse.

The positive and significant influence of Service Quality on Reuse Intention with Customer Satisfaction as an intervening variable is also confirmed in this study. This finding is consistent with previous research by Wang et al. (2019), who found that service quality has a positive and significant impact on the intention to reuse through customer satisfaction.

The positive and significant influence of Customer Value on Reuse Intention with Customer Satisfaction as an intervening variable is also supported by the findings of this study. This finding is consistent with previous research by Kim et al. (2019), which demonstrates that customer perceived value has a positive and significant impact on the intention to reuse through customer satisfaction.

Conclusion

Based on the analysis and discussion, the following conclusions are drawn:

- Service Quality and Customer Value have a positive and significant influence on Customer Satisfaction.
- Service Quality, Customer Value, Environment Concern, and Customer Satisfaction have a direct positive and significant impact on Reuse Intention.
- Service Quality and Customer Value have an indirect positive and significant influence on Reuse Intention with Customer Satisfaction as an intervening variable.

Based on the conducted research, a suggestion for future studies is to include the Theory of Planned Behavior (TPB) variable to understand how the public responds to the quality of services provided in relation to satisfaction and intention to reuse the public transportation service of Teman Bus Mamminasata.

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