

# Exploring Bandung Public Bus Commuter Satisfaction and Loyalty

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**Abstract.** Bandung, the capital of West Java, is 2021 Indonesia's most crowded city. Congestion happens even then since the number of cars in Bandung has grown by an average of 11% annually. To overcome the congestion, the Ministry of Transportation Republic Indonesia programme created the "Teman Bus" programme in December 2021. Therefore, this study explores the impact of factors influencing passenger loyalty towards public bus services. A cross-sectional survey of bus users in Bandung was conducted in June 2022, with 211 respondents. The data were analysed using structural equation modelling. Using PLS-SEM, the relationship between constructs and loyalty was examined, and importance-performance map analysis was used to determine which drivers should prioritise increasing levels of a target construct of interest. The results indicate that perceived safety and security, perceived service quality, and image significantly influence loyalty. It also implies that those three variables, as revealed by the study's findings of the importance and performance matrix, need to be improved to increase customer loyalty when it comes to bus services.

**Keywords:** Bus Rapid Transit, Loyalty, Satisfaction, Service Quality, PLS-SEM

## 1. Introduction

One of the most significant issues with urban transportation is congested roads. (Aftabuzzaman et al., 2010). Due to the uncontrolled and rapid increase in the percentage of vehicles, urban traffic congestion is a concern in nations. As a result, fuel consumption, pollution, costs, and productivity have all increased (Redman et al., 2013). It also happened in Indonesia. In 2016, Inrix, a transportation analysis company, released data on traffic conditions worldwide. Indonesia was included in the ranks of the countries most concerned about the condition of traffic jams, to be precise, in the second worst ranking in the world. (Kompas, 2017).

One of the cities in Indonesia that has been ranked as the 14th most congested city in Asia and first as the most congested city in Indonesia is the City of Bandung (Suci, 2019). According to Ibrahim (2021), Bandung, the capital of West Java, Indonesia, surpassed Jakarta, Malang, Yogyakarta, Padang, Medan,

and Pontianak to become Indonesia's most crowded city 2021. Congestion happens even then since the number of cars in Bandung has grown by an average of 11% annually. As a result, many of the highways in Bandung are congested. Additionally, 98 per cent of automobiles are used for personal mobility, with only 2 per cent for public transportation (Putra, 2021). In addition, according to Alhamidi (2022), the number of public transportations in the city of Bandung continues to decline every year. Based on data from the Central Bureau of Statistics, the number of public transportation in 2019 reached 13,610 units. In 2020 it decreased to 12,514 units, and in 2021 it decreased again to 11,812 units.

One of the plans that were initiated to reduce congestion in the city of Bandung by the Bandung City Transportation Service is to apply an odd-even rule. This program was created because congestion conditions were monitored at 17 road sections or even more at certain times (Soraya, 2022).

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However, the plan for implementing an odd-even number in the city of Bandung has now been dismissed or has yet to be implemented (Kurniawan, 2022).

According to Aftabuzzaman (2010), one potential solution for the issue of urban road traffic congestion is adequate public transportation (PT). However, public transportation in Bandung is also being concerned. The poor public transportation in Bandung has been complained about by residents and tourists more than once. For example, Trans Metro Bandung, which has been in operation since 2011/2012, the number of buses and routes served by these buses getting smaller. Some of the Trans Metro Pasundan corridors are not progressing much because some of the corridors have been stopped due to refusal by “angkot” drivers (BBC, (2023); detiktravel, (2023)). Utilizing Trans Metro Bandung and school buses, among other current public transportation options, to their fullest potential is what the city authorities of Bandung must do in the short term to reduce congestion (Solehudin, 2019).

Previously, Trans Metro Pasundan is The Ministry of Transportation Republic Indonesia programme to create the "Teman Bus" initiative in December 2021, which is a cashless, telematics-based, road-based urban public transportation system. A program known as Buy the Service (BTS) for the Bus Rapid Transit (BRT) system called Trans Metro Pasundan is part of this "Teman Bus" operation. There are 85 buses for this program that are prepared to operate passenger services on 5 separate routes (Jabarprov, 2021; Kautsar, 2021; Nugrahadi, 2021; Primadhyta, 2022; Ridwan, 2022).

According to Nguyen-Phuoc et al., (2021) and Waterson et al., (2003) buses are occasionally considered to be the only means of public transportation in developing countries since they often need less capital investment than other public transport systems like trains or trams. Bus services are accessible, dependable, and reasonably priced from the perspective of

the client, which encourages people to shift from private car or motorcycle.

A key component of creating socially, environmentally, and economically sustainable communities are implementing transportation regulations that aim to promote public transportation use while minimizing car dependence (European Commission, 2017). Developing and maintaining passenger loyalty is a technique that promotes increasing ridership since loyal passengers would continue to use a public transportation service without seeking or switching to alternative options and are likely to suggest the service to possible new users. (Vicente et al., 2020).

Therefore, based on the discussion above, this study aims to explore the impact of several factors that affect passenger loyalty towards public bus services. Public bus is selected as the previous study regarding the selection of mode choice in Bandung has been studied by Joewono et al. (2023). It was found that the bus is one of the alternatives which the respondents chose by considering the time and costs as the most significant factors. According to Syakura (2022), West Java Governor stated that the “angkot” conversion program to buses in the Greater Bandung area would begin in 2023. This program is one of the concepts of the mass transportation master plan, which is expected to be able to overcome congestion.

The remainder of this article is organized as follows. Section 2 describes the literature and hypotheses development. Section 3 presents the research methodology. Section 4 discussed the findings of the results. The final section provides conclusions, policy implications, study limitations, and ideas for future research.

## 2. Literature Study / Hypotheses Development

### *Bus Rapid Transit (BRT)*

A public transportation system based on buses, known as bus rapid transit (BRT), intends to combine a bus system's adaptability and lower cost with the capacity and speed of a rail system. BRT, a low-cost rapid transit system resembling rail, may provide bus routes with higher service levels. Bus-only lanes, fare prepayment systems, customer information, fewer stops, and high-capacity buses are some enhancements that contribute to the outstanding quality of service. In that sense, BRT typically outperforms traditional buses in terms of speed, comfort, frequency of service, and schedule dependability (Zheng et al., 2021). Public transportation with high occupancy rates is an effective way to transport vast crowds of people from one place to another, especially in densely populated urban areas (Atombo & Dzigbordi Wemegah, 2021). Communities with high-quality public transportation systems are likely to have much fewer vehicles on the road, claim (Litman, 2017). As a result, the bus system may be a helpful instrument for policymakers to reduce the number of vehicles and traffic on metropolitan roadways. Given that so many people in Bandung fall into the low-income category, there is a strong need for public transportation (Fields, 2011). However, the reality is that insufficient bus services have caused effective bus service to deteriorate and remain a distant dream for many cities (Atombo & Wemegah, 2021).

### *Customer Loyalty*

The definition of loyalty has not been widely accepted due to the difficulties in measuring it and the associated approaches used for this aim. Numerous writers have tried to explain the idea of loyalty in the context of their philosophies. According to Van Lierop et al. (2018), the notion of loyalty in the transportation literature is unclear. This happens because loyalty is a relatively new research area, and there is still disagreement about how to evaluate it. While some scholars contend that satisfaction ought to be

incorporated into the concept of loyalty, others disagree. For instance, it has been proposed by several authors that users of public transportation would exhibit behavioral and emotional loyalty toward the system if they are (1) overall satisfaction, but also (2) planning to use it in the future, and (3) willing to promote it to others. On the other hand, Oliver (1999) defined *loyalty* as customers' strong determination to continue purchasing a certain product.

### *Perceived Service Quality*

One of the main areas of discussion in the study of service businesses was service quality (Ladhari, 2009). It also has been widely discussed in marketing since Parasuraman, Zeithaml, and Berry proposed their conceptual model in 1985 (Kuo & Tang, 2013). As it has been crucial in creating policies to improve PT ridership, this topic has also been explored frequently in other industries, such as public transportation systems (Lai & Chen, (2011); Ladhari, (2009)). *Perceived service quality* is defined as the "consumer's judgement about an [service] 's overall excellence and superiority" (Zeithaml V., 2018). It has been extensively studied how customers' perceptions of the quality of PT services affect their satisfaction and loyalty (Hensher, (2013); (Wang et al., (2017); Eboli & Mazulla, 2007)). Studies have been conducted on the relationship between perceived service quality and perceived safety in ride-hailing services (Su et al., 2019). Additionally, it was shown that service quality played a crucial role in developing the corporate image of PT services (Kuo & Tang, 2013). In this research, there are four hypotheses regarding the perceived quality of public bus services:

*H1a: Perceived service quality have a positive effect on perceived safety and security*

*H1b: Perceived service quality have a positive effect on the image of public bus services*

*H1c: Perceived service quality have a positive effect on passenger satisfaction towards public bus services*

*H1d: Perceived service quality have a positive effect on passenger loyalty towards public bus services*

### *Perceived Safety and Security*

Security-related issues can be divided into three main groups: safety from accidents, safety from crime, and how citizens perceive security. The chance that passengers may be involved in an accident or become a victim of a crime was taken into account while evaluating security and safety in transportation (Nguyen-Phuoc et al., 2021). Other factors, including availability, accessibility, customer service, comfort, subjective safety and security, were essential components of passenger satisfaction. (Winzer et al., 2009). Figler et al. (2011) showed the linkage between perceived safety and passengers' loyalty. Nguyen-Phuoc et al. (2021) studied the relationship between perceived safety and security towards the image. The hypotheses of the relationships among perceived safety, security, image, and passenger satisfaction and loyalty for bus services are proposed as follows.

*H2a: Perceived safety and security have a positive effect on the image of public bus services*

*H2b: Perceived safety and security have a positive effect on passenger satisfaction of public bus services*

*H2c: Perceived safety and security have a positive effect on passenger loyalty towards public bus services*

### *Switching Cost and Private Mode Attractiveness*

Zeithaml (2018) considers the perceived cost as something one loses or gives up providing a service. The perceived cost of the present alternative is compared to other alternatives to determine the switching cost (SC). SC refers to the time, money, and effort costs associated with switching service providers; these costs may be attributable to looking for a better service provider or picking up new service usage skills (Jones et al., 2000). Jones et al. (2000) stated that switching barriers directly and positively affect customer loyalty. This article examines the connection between vehicle attractiveness, switching cost, and customer loyalty because CA and SC are sub-constructs of switching barriers. SC is the comparison of perceived costs between two alternatives. In this study, car attractiveness was to be private mode attractiveness as the

respondent gathered are the car owner and/or motorcycle owner

*H3a: Private mode attractiveness have a positive effect on customer loyalty.*

*H3b: Switching cost have a positive effect on customer loyalty.*

*H3c: Service quality and Switching cost are positively correlated.*

### *Image*

Corporate image is the customers' subjective perception of a brand or company that offers a product or service (Song et al., 2019). A company's corporate image is primarily constructed by the service quality of that company (Grönroos, 1984). According to Flavian et al. (2005), one can view the corporate image as a valuable strategic tool that can help a firm achieve its long-term objectives by increasing the value and reputation of its brands, businesses, products, and services. Since a strong and unified corporate image develops over time and becomes a crucial component of competitiveness in the business world, it is one of the most complex resources to replicate. Customers are more likely to buy a firm's goods or services if its corporate image is very high (Hsu et al., 2006). The marketing literature demonstrated that image had a favourable direct impact on satisfaction and was crucial for forming behavioural loyalty (Martenson, 2007). The following hypothesis is proposed:

*H4a: Image of bus services have a positive effect on passenger satisfaction towards public bus services*

*H4b: Image of public bus services have a positive effect on passenger loyalty towards public bus services*

### *Satisfaction*

Oliver (2010) defines *satisfaction* as "a determination that a feature of a good or service, or the good or service itself, delivers a pleasurable level of consumption-related fulfilment. According to Woodruff et al. (1983), customer satisfaction is a quick emotional reaction that reflects actual performance. According to Kotler (2000), pleasure is the emotion that results from contrasting expectations and performance. In

various fields, including marketing and customer service, there is a strong correlation between customer satisfaction and customer loyalty (Nam et al., 2011). The connection between loyalty and satisfaction has been shown in the context of transportation. Customers of public transportation who are happy with the services will continue utilizing them and subsequently suggest them to others (van Lierop et al., 2018). The positive relationship between consumer satisfaction and customer loyalty in ride-hailing is also validated (Nguyen-Phuoc et al., 2020).

Therefore, this study proposed:

*H5: Passengers' satisfaction has a positive effect on passengers' loyalty towards public bus services*

### Trust

The importance of trust in influencing customers' decision to continue using a service has long been acknowledged (Ma et al., 2019). The definition of *trust* given by Mayer et al. (1995) is "the willingness of a party [trustor] to be vulnerable to the actions of

another party [trustee] based on the expectation that the other [trustee] will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party [trustee]." In a previous study by Ashley & Leonard (2009) and Pasharibu et al. (2018), customer satisfaction and loyalty directly correlate with passenger trust. As the maintenance and development of trust will lead to loyalty, trust is also the cornerstone of loyalty (Minser & Webb, 2010). According to van Lierop et al. (2018), a long-lasting and trustworthy relationship between public transportation users and the companies that offer it boosts customer loyalty. As a result, the proposed hypotheses are:

*H6a: Passengers' trust towards public bus services has a positive effect on passengers satisfaction towards public bus services*

*H6b: Passengers' trust towards public bus services has a positive effect on passengers loyalty towards public bus services*

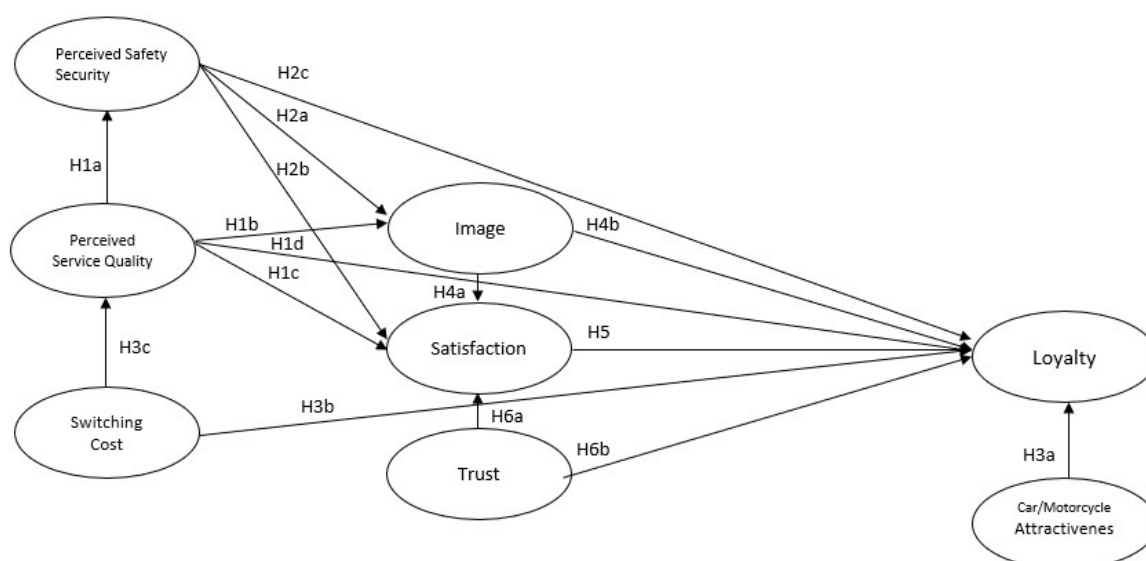


Figure 1  
Conceptual Model

### 3. Methodology

Questionnaire-based surveys are used in collecting data from the respondent who live and work in Bandung. The survey was distributed through google forms in June

2022. The questionnaire is made up of three sections. In the first part of the survey, information was gathered on the respondents' which bus services they often use to ensure that the respondents are bus users. The buses came in two types: DAMRI and Trans Metro Bandung/Pasundan. The second section of

the questionnaire, which is the main section, has several 7-point Likert scale questions that range from "strongly disagree" (1) to "strongly agree" (7) and were created to assess the behaviour of bus passengers. The last part is the question mainly asks general information about the respondent, such as the respondents' current bus routes, the purpose of using the bus, gender, age, occupation, income, and car or motorcycle ownership.

Considering the minimum requirements of adequate sample sizes, scholars have different opinions concerning the criteria. The most cited minimum sample size determination is the 10-time rule (Hair, 2021), which suggests sample size should be ten times the number of independent variables in the complex relationship or the maximum number of inner relationships pointing to any dependent variable in the structure model. Data collection will be conducted by survey method using a questionnaire with a cross-sectional time horizon. Greater Bandung was chosen for the survey distribution.

This study's data analysis will use PLS-SEM with smartPLS as the data processing tool. A structural equation model (SEM) has been used to examine the relationship between constructs and consumer loyalty. The least squares-based approach (PLS-SEM) has been used to analyze the data due to the complexity of the generated model. There are two primary components of PLS-SEM. The measuring model, often known as the outer model, is the first component. The outer model evaluates how effectively the total collection of indicators reflects a variable by estimating each indicator's contribution to reflecting its associated latent variable. The inner model measures the latent variables' direct and indirect connections.

According to Latan & Noonan (2017:369), in general, the Importance and Performance Matrix, based on the findings of a customer satisfaction survey analysis, creates a two-dimensional map by utilizing a vertical line for importance and a horizontal line for performance (Y-axis). Meanwhile, according to Ramayah et al. (2018), Importance and Performance Matrix Analysis (IPMA) is used to develop survey results from Smart PLS or to find development suggestions based on scores of latent variables.

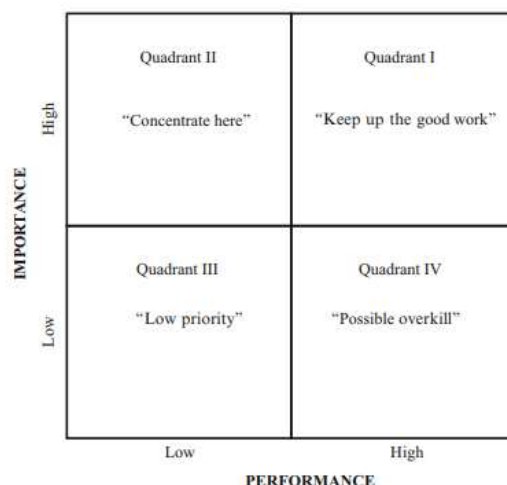


Figure 2. Mapping Importance and Performance Matrix Analysis

Source: Latan & Noonan (2017)

Based on Figure 2, according to Latan and Noonan (2017), it can be concluded that Quadrant 1 (Keep up the good work) has High Performance and High Importance, which means there is an opportunity to increase or maintain a higher level than the target construct. Quadrant II (Concentrate Here) has High Importance and Low Performance, which means that it is a crucial element for development. Quadrant III (Low priority) consists of low importance and low performance.

In this case, it does not deserve special attention or additions. Quadrant IV (Possible overkill) consists of High Performance and Low Importance, which means that the resource should be used elsewhere because, at

this point, it does not require additional attention.

#### 4. Findings and Discussion

Details of the surveys with typical characteristics are provided in Table 1. 211 individuals completed the questionnaire in total. In the first stage of the questionnaire, the respondents were asked about the type of bus they often used. Table 1 will show the respondent's bus selection results, either DAMRI and/or Trans Metro Bandung/Pasundan. This section is also to ensure that those who fill out the questionnaire are bus users.

Table 1  
*Respondent Currently Used Bus.*

Type of Bus	n	%
DAMRI	57	27%
Trans Metro Bandung/Pasundan	79	37%
DAMRI & Trans Metro Bandung/Pasundan	75	36%
Total	211	100%

Source: Processed by the writer, 2022

It can be seen in Table 1 above. DAMRI users are 27% (57 respondents), Trans Metro Bandung/Pasundan users 37% (79 respondents) and lastly, respondents who currently use those two types of the bus are 36% (75 respondents). Table 2 below shows

the purpose of using the bus, how often they used it, and which route they often travelled. Table 2 below shows the respondents purpose of using public bus services.

Table 2  
*Respondent Purpose of Using Bus.*

Purpose	N	%
Shopping	56	26.5%
Go to school	56	26.5%
Go to work	52	24.6%
Family visit	44	20.85%
Avoid using "angkot"	1	0.4%

Source: Processed by the writer, 2022

From Table 2 above, it can be seen that most people use the bus services for shopping, school, work, and family visits. Interestingly, a

respondent avoids using the angkot by using the bus. Table 3 below discusses the frequency of the respondent using the bus.

Table 3.  
*Frequency of Using Bus*

Frequency	N	%
1 Times in a week	64	30%
2 Times in a week	66	31.2%
3 Times in a week	50	23.6%
4 Times in a week	29	13.7%
>5 Times in a week	2	1%

Source: Processed by the writer, 2022

As it can be seen from Table 3 above which shows the frequency of the respondents using the bus. Mostly, the respondents using bus twice in a week, and some are only once in a week. The respondents which also using bus

three times a week are 29 respondents (13.7%). There are also two respondents which are using bus more than five times in a week. Further, in Table 4 will show the bus route choices by the respondents.

Table 4.  
*Route Choice*

Route	N	%
Trans Metro Bandung/Pasundan		
Leuwipanjang – Soreang	26	12%
Kota Baru Parahyangan – Alun-alun Bandung	38	18%
Baleendah – Bandung Electronic Center	36	17%
Leuwipanjang – Dago	11	5%
Dipatiukur - Jatinangor	20	9%
DAMRI		
Leuwipanjang - Dipatiukur	5	2%
Leuwipanjang – Ledeng	6	3%
Leuwipanjang – Cicaheum	1	0.5%
Kebon Kelapa – Cibiru	4	1.8%
Kebon Kelapa – Tanjung Sari	8	4%
Dipatiukur – Jatinangor	4	1.8%
Alun-alun – Ciburuy	6	3%
Elang – Jatinangor	7	3.3%
Cicaheum – Cibereum	10	5%
Leuwipanjang – Cibiru	13	6%
Alun-alun – Kota Baru Parahyangan	5	2%
Elang – Cibiru	11	5.2%

Source: Processed by the writer, 2022

From Table 4, it can be seen that mostly with some are the same destination with DAMRI, the respondents are mostly used Trans Metro Bandung/Pasundan for commuting. Table 5 below discussed the respondent

characteristics. It can be seen that from 211 respondents, the respondents consisted of 125 males and 86 females. As for the age, most participants were classified into the age of 16-20 years with a total of 71 people, 31 people



from the age of 21-25 years, 34 people from the age of 26-30 years, 35 people from the age of 31-35 years, 30 people from the age of 36-40 years and the last is ten people from the age over 40 years old. According to the respondent's level of education, 53% of the respondents come from undergraduate backgrounds. The second is from a high school background (46%), and only 2% is from a master's degree background. Lastly is the ownership of two-wheeled vehicles,

namely motorcycles and four-wheeled vehicles. The questionnaire also asks how many participants have private vehicles such as motorbikes or cars. For motorcycle ownership, the majority, which accounts for 50.95% of the respondents, only had one motorbike. As for car ownership, 104 people, or as much as 49.95% of the respondents, do not own a car.

Table 5.  
*Respondent Characteristics*

	n	Percentage
<b>Gender</b>		
Male	125	59%
Female	86	41%
<b>Age</b>		
16-20 Years	71	33.6%
21-25 Years	31	14.6%
26-30 Years	34	16.1%
31-35 Years	35	16.5%
36-40 Years	30	14.2%
>40	10	4.7%
<b>Level of Education</b>		
High School	96	45%
Undergraduate	112	53%
Master's degree	3	2%
<b>Motorcycle ownership</b>		
0 Unit	31	14.28%
1 Unit	107	50.95%
2 Unit	49	23.33%
3 Unit	23	10.95%
>3 Unit	1	0.4%
<b>Car ownership</b>		
0 Unit	104	49.5%
1 Unit	91	42.8%
2 Unit	22	10.4%
3 Unit	4	1.9%
>3 Unit	1	0.47%

Source: Processed by the writer, 2022

After discussing the respondent characteristics, Table 6 in this study's results reveals the internal consistency reliability findings. Table 6 displays the results of the

average variance extracted (AVE), convergent validity, discriminant validity, and outer loadings.

Table 6.  
Internal Consistency Reliability

Constructs	Items	Loading	CA	CR	AVE
Perceived Safety and Security (PSS)	PSS1	0.731			
	PSS2	0.726			
	PSS3	0.751	0.8	0.9	0.6
	PSS4	0.842			
	PSS5	0.798			
	PSS6	0.728			
Perceived Service Quality (PSS)	SQ1	0.818			
	SQ2	0.792	0.8	0.9	0.6
	SQ3	0.800			
	SQ4	0.751			
Image (IMA)	IM1	0.888	0.6	0.8	0.7
	IM2	0.797			
Satisfaction (SAT)	ST1	0.806			
	ST2	0.839	0.7	0.8	0.7
	ST3	0.785			
Loyalty (LOY)	LY1	0.814			
	LY2	0.825	0.7	0.9	0.7
	LY3	0.839			
Switching Cost (SC)	SC1	0.817	0.6	0.8	0.7
	SC2	0.819			
Trust (TRU)	TR1	0.877	0.5	0.8	0.7
	TR2	0.790			
Private Mode Attractiveness (PMA)	PM1	0.857	0.6	0.8	0.7
	PM2	0.783			

Source: Processed by the writer, 2022

The Cronbach's Alpha value examined each construct's components for internal consistency. The Cronbach's alpha (CA) values for PSS, PSQ, SAT, and LOY are shown in Table 6 to be over 0.7, whereas those for IMA, SC, TRU, and PMA are below 0.7. The composite reliability values of all constructs, which varied from 0.8 to 0.9, exceeded the recommended cutoff point of 0.7. (Hair et al., 2016). These tests provided reassurance on the internal consistency of these constructs.

The measuring model's convergent validity was assessed using factor loadings and AVE. Table 6 shows that most component factor loading values were higher than 0.5 and demonstrated high-reliability levels. In the exploratory study, all results between 0.6 and 0.7 were considered "acceptable" (Hair et al., 2016). Compared to the suggested value of 0.5, the AVE values of the constructs, which were used to measure the expected variation in a particular construct, ranged from 0.6 to 0.7. These experiments demonstrated the reliability of the measurement model's convergence. Furthermore, Table 7 discusses the results of the Fornell-Larcker Criterion.

Table 7.  
Fornell-Larcker Criterion

	PSS	PSQ	IMA	SAT	LOY	TRU	PMA	SC
PSS	0.764							
PSQ	0.762	0.791						
IMA	0.694	0.619	0.844					
SAT	0.731	0.746	0.698	0.811				
LOY	0.740	0.679	0.703	0.644	0.826			
TRU	0.440	0.337	0.329	0.352	0.509	0.835		
PMA	0.589	0.512	0.498	0.540	0.550	0.494	0.821	
SC	0.414	0.492	0.430	0.400	0.400	0.310	0.280	0.835

Source: Processed by the writer, 2022

The Fornell-Larcker criterion was used to test the discriminant validity of a concept to see how much it differed from other constructs within its constituent (Bagozzi & Yi, 1988). Accordingly, each construct's square root of the AVE should be more significant than all of its cross-loading with other constructs. The Fornell-Larcker Criterion is shown in Table 7 above. It can be seen that the square root of AVE for each latent variable was the highest compared to its correlation values with other latent variables where the variables are significantly associated with one another. This indicates that the constructs' discriminant validity evaluation met the criteria.

The first step in evaluating it using PLS is the R-Squares value for each endogenous latent variable as a measure of the structural model's predictive capacity. It is possible to determine if particular exogenous latent factors significantly impact endogenous latent

variables by examining changes in the value of R-squares. A strong, moderate, and weak model may be inferred from R-Squares values of 0.75, 0.50, and 0.25. The Q2 predictive relevance may be used to evaluate the PLS model in addition to looking at the R-Squares values. According to Hair et al. (2019) and Ghazali and Latan (2015), this approach may synthesize cross-validation and fitting functions with predictions from observed variables and produce parameter estimates. One aspect of structural equation model testing is the examination of predictive capabilities. The coefficient of determination (R2), which shows the percentage of variation explained by each endogenous variable, is used to assess the prediction accuracy and predictive significance. According to Hair et al. (2019), the value of R2 ranges between 0 and 1, with a higher R2 value indicating a high level of prediction accuracy (Ghozali & Latan, 2015). Table 8 presents the evaluation of predictive accuracy and predictive relevance.

Table 8.  
Evaluation of Predictive Accuracy and Predictive Relevance

Constructs	R <sup>2</sup>	Q <sup>2</sup> (=1-SSE/SSO)
PSS	0.581	0.336
PSQ	0.242	0.147
IMA	0.501	0.346
SAT	0.621	0.422
LOY	0.673	0.442

Source: Processed by the writer, 2022

As seen in Table 8 above, the PSS, IMA, SAT, and LOY constructs have  $R^2$  values higher than 0.5. This result leads to a conclusion of a moderate level of predictive accuracy (Ghozali & Latan, 2015). However, for perceived service quality  $R^2$  shows a low level of predictive accuracy, with the  $R^2$  results below 0.25. However, the method of calculating the  $Q^2$  value when using SmartPLS 3.0 was blinded for the evaluation of predictive significance. According to Hair et

al. (2014), the value of  $Q^2 > 0$  proved that endogenous variables in the model had predictive importance. The findings also revealed that all of the  $Q^2$  values for each construct were positive, indicating that there was adequate. The results also showed that each construct's  $Q^2$  value was positive, supporting the notion that the model this study proposes is of predictive importance. Table 9 details the results of the direct effects.

Table 9.  
*Direct Effects Among Constructs Results*

Path Relation	Path Coef	t-value	Result
H1a: PSQ → PSS	0.726	20.781	Supported
H1b: PSQ → IMA	0.217	2.280	Supported
H1c: PSQ → SAT	0.452	5.429	Supported
H2a: PSS → IMA	0.528	6.134	Supported
H2b: PSS → SAT	0.370	4.504	Supported
H2c: PSS → LOY	0.259	2.953	Supported
H2d: PSQ → LOY	0.210	2.305	Supported
H3a: PMA → LOY	0.038	0.687	Rejected
H3b: SC → PSQ	0.492	9.554	Supported
H3c: SC → LOY	-0.019	0.354	Rejected
H4a: IMA → SAT	0.322	5.016	Supported
H4b: IMA → LOY	0.303	4.375	Supported
H5: SAT → LOY	-0.012	0.121	Rejected
H6a: TRU → SAT	0.037	0.514	Rejected
H6b: TRU → LOY	0.209	3.658	Supported

Source: Processed by the writer, 2022

As shown from the hypothesis testing in Table 9 above, there are 11 out of 15 accepted hypotheses. This happens because the t value in the hypothesis has a value of more than 1.96% at the 5% significance level. There are three rejected hypotheses, namely H3a, H3c, H5, and H6a, because the t-value is less than 1.96 for a significance level of 5. %. It can be presumed that bus user loyalty is affected by other factors such as perceived safety and security ( $\beta_{PSS \rightarrow LOY} = 0.259, t = 2.953$ ), perceived service quality ( $\beta_{PSQ \rightarrow LOY} = 0.210, t = 2.305$ ), image ( $\beta_{IMA \rightarrow LOY} = 0.303, t = 4.375$ ), and trust ( $TRU \rightarrow LOY = 0.209, t = 3.658$ ) which image has a substantial impact on loyalty than other variables. In

addition, the results obtained indicate that perceived safety and security, image, and perceived service quality are variables that affect user satisfaction with a t-value of 4.504, 5.016 and 5.429. Finally, the perceived service quality from the public bus results shows a positively influenced perceived safety and security of bus users ( $\beta_{PSQ \rightarrow PSS} = 0.726, t = 20.871$ ), and the perceived safety and security has a positive effect on the image ( $\beta_{PSS \rightarrow IMA} = 0.528, t = 6.134$ ). Interestingly, this study shows that satisfied passengers are not influenced by their loyalty, as the results are rejected. Futehr, more details on indirect impacts are provided in table 10.

Table 10.  
Results of Indirect Effects Between Each Construct and Loyalty

Special indirect effects	Path Coef	t-value
PSQ→PSS→IMA	0.401	6.283
PSQ→PSS→SAT	0.163	2.877
PSQ→PSS→LOY	0.200	2.930
PSQ→IMA→SAT	0.066	2.042
PSQ→PSS→IMA→LOY	0.122	3.407
PSQ→PSS→IMA→LOY	0.127	4.476
PSS→IMA→LOY	0.166	4.416
SC→PSQ→PSS→IMA→LOY	0.064	3.668
SC→PSQ→PSQ→IMA→SAT	0.60	3.052
SC→PSQ→IMA	0.107	2.116
SC→PSQ→PSS→SAT	0.080	2.734
SC→PSQ→PSS→LOY	0.099	2.785
SC→PSQ→PSS	0.375	7.381
SC→PSQ→SAT	0.190	4.174

Source: Processed by the writer, 2022

The data showed in Table 8 are the only indirect effect which shows significant as the t-value above the threshold of 1.96 at a significant level 0.5, the mediating interactions

among constructs, as proposed by Hair et al. (2016), were supported. Table 11 discussed the total effects on loyalty.

Table 11.  
Results of Total Effects on Loyalty

Total Effects	Path Coef	t-value
PSS→LOY	0.425	5.110
PSQ→LOY	0.598	8.372
IMA→LOY	0.322	5.016
SAT→LOY	-0.012	0.121
SC→LOY	0.276	4.564
PMA→LOY	0.038	0.687
TRU→LOY	0.209	3.610

Source: Processed by the writer, 2022

The results of the effects on loyalty as we can see in Table 11 presented the total effects of different determinants on the loyalty of public bus users. As shown in Table 7, perceived service quality had the significant total effect

on LOY ( $\beta = 0.598$ ), followed by PSS ( $\beta = 0.425$ ), IMA ( $\beta = 0.322$ ), SC ( $\beta = 0.276$ ) and last is SAT ( $\beta = -0.012$ ) as the lowest. Lastly, figure 2, presents the important and performance matrix analysis results.

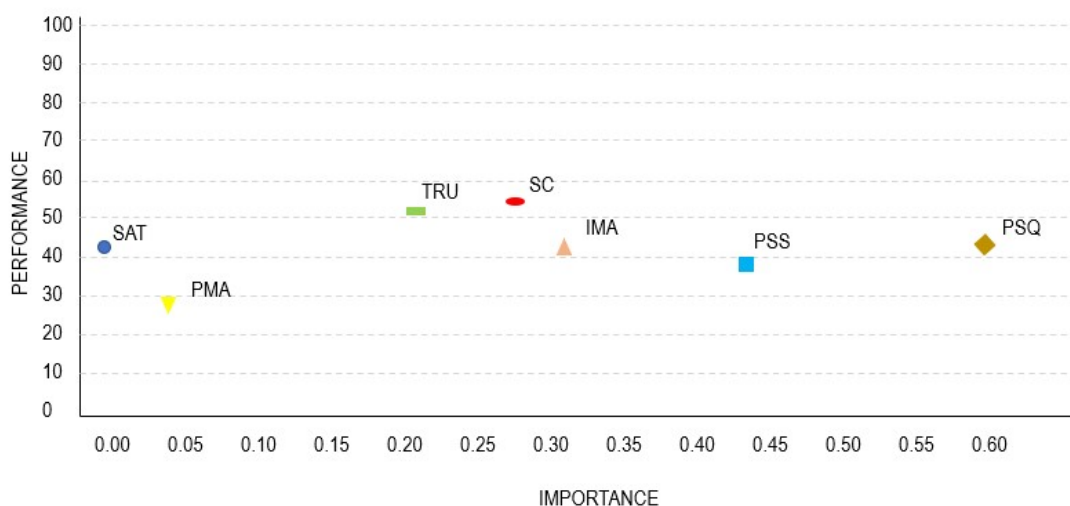


Figure 3.  
Importance and Performance Matrix Analysis  
Source: Processed by the writer, 2022

Figure 3 shows the analysis results of the importance and performance map analysis. As can be seen from Figure 3 which shows perceived service quality, perceived safety and security and image are categorized in Quadrant II “concentrate here”. However, for satisfaction, private mode attractiveness is in Quadrant III “low priority”. Lastly, trust and switching cost are categorized in Quadrant IV “possible overkill”.

### 5. Conclusion

The study's findings suggest that it is essential to understand both the direct and indirect effects factors on loyalty. The concept model used in this study is also to understand how the perceived safety and security, perceived service quality, image, trust, switching cost, private mode attractiveness, and satisfaction are about how these things can affect the loyalty of DAMRI and Trans Metro Bandung/Pasundan bus services, as well as passenger loyalty to these bus services.

The use of important and performance map analysis in this study can also formulate what aspects the bus operator needs to do to increase the loyalty of the bus users.

### *5.1 Theoretical Implications*

This study has contributed to the literature by developing a conceptual model for predicting passenger loyalty towards public bus services in developing country cities. The results showed that perceived service quality, perceived safety and security, image, satisfaction, and trust directly affected passengers' loyalty towards public bus services in Bandung. Perceived service quality is found to be the most significant variables which influence loyalty. Perceived service quality is defined as the "consumer's judgement about the service's overall excellence and superiority" (Zeithaml V., 2018). Second is perceived safety and security which also have an impact on the loyalty. The image of bus services was also found to be the most important variable. The concept of the image was based on how a passenger viewed the public bus services as contributing to their welfare and society at large. This finding was supported by the study from Minser & Webb (2010) and Nguyen-Phuoc et al. (2021b), which indicated that passengers with a positive image of the public bus services would feel satisfied with the service and intend to use the mode in the future. Trust in public bus services was the shows significant predictor of passenger loyalty. Trust is also the foundation of loyalty, as trust development and maintenance will result in loyalty (Minser & Webb, 2010). In the Indonesian context regarding image and trust, Keni et al. (2021) found that image has a positive impact on loyalty, and Wirayat & Rachmawati (2020) found it in terms of buying products. Trust becomes a variable which influences the loyalty of the consumer.

### *5.2. Managerial Implications*

The importance-performance map analysis results from this study have managerial implications. According to the IPMA results, trust and switching costs are in Quadrant IV, indicating high performance and low

importance. So, the resource should be used elsewhere because, at this point, it does not require additional attention regarding trust and switching cost of the passengers towards the public bus services. However, satisfaction and private mode attractiveness are categorized in Quadrant III, which is low priority. Low priority consists of low importance and low performance. In this case, it does not deserve special attention.

The perceived service quality, safety and security, and image belong inside quadrant II, characterized as "concentrate here" as those three variables are in Quadrant II. Based on these data, public bus providers must focus highly on perceived safety and security, perceived service quality and image.

For the perceived safety and security. According to Joewono and Kubota (2006), the European Commission's suggested hierarchy of quality determinants for public transportation has multiple classifications, including safety and security. In that hierarchy of quality factors, *security* is defined as the psychologically generated sensation of security and the degree of actual safety from accidents or crimes. The first security class focuses on preventing crime and includes personnel or police presence, illumination, visual surveillance, layout, and designated aid points. The second is protection from accidents, which includes the availability or visibility of support, the avoidance or visibility of risks, and staff members who actively provide protection. Safety and security also determine the likelihood that passengers would suffer injuries in an accident, whether one involves a car or not (safety), or that one will become the victim of crime (security). However, perceived service quality is the customer's evaluation of the service's overall excellence or superiority (Zeithaml V., 2018). According to Parasuraman et al. (1985), the difference between expectations and perceptions of actual performance levels determines how well customers perceive the overall quality of the service. Therefore, the relationship between perceived and expected services operationalises service quality.

Specific components or characteristics often make up service quality. Each element will impact a different aspect of service excellence. The 12 essential components of service quality were covered in a study by Abu Bakar et al. in 2022. The characteristics discussed were related favourably to the performance of buses in terms of service quality. The characteristics include convenience, reliability, comfort, safety and security, route and travel time, schedule, speed, frequency of services, performance accuracy, service hours, headway, and service coverage. Lastly, for image, in building customer loyalty, the overall image of a product/service and customers' past behaviour significantly impact their future intentions or behaviour.

#### 6. Limitations and Further Research

In addition to providing theoretical and managerial contributions, this study also has some limitations. In this study, there was no moderating effect on gender, age, income level, education, or the number of private vehicle owners the respondents had. Future research can also study the service quality of public bus services in Indonesia as mentioned above that there are 12 attributes of service quality. Further, it can be helpful to improve the service from the bus providers. The results of this study can also be strengthened by conducting research in other cities in Indonesia, which have facilities and access to public buses, considering that there will be different backgrounds, facilities, demographics, and behaviours.

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