VOL. 17, NO. 13, JULY 2022 ISSN 1819-6608
ARPN Journal of Engineering and Applied Sciences

www.arpnjournals.com

ANALYSIS OF PUBLIC TRANSPORT USER MOVEMENT IN SEM-PLS

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ABSTRACT

The characteristics of the movement of public transportation users in South Tangerang City must be reviewed and analyzed so that the use of public transportation can be used as one of the best alternatives in providing services for an integrated city infrastructure system. So that every decision on the implementation of public transportation policies in this case the local government can get optimal results and plans to increase public interest in the use of public transportation can be realized. The purpose of this study is to identify the characteristics of public transportation users who use the station in South Tangerang City, to find out the factors that influence people's satisfaction in choosing a bus station, and to analyze the effect of movement, mode facilities and zones on user satisfaction and perceptions of users of public transportation station. The research approach used is quantitative with primary data sources obtained from a questionnaire instrument to 160 users of Public Transportation Bus Station in South Tangerang City. The data analysis method used is Structure Question Modeling (SEM) - Partial Least Square (PLS) with the Smart PLS 3.0 program to determine the factors that influence user satisfaction and to determine the instruments that need to be improved in station development. The results of the analysis show that the factor that has the most direct influence on the satisfaction of public transportation users in South Tangerang City is the mode facility variable, while the zone variable does not have a significant effect on Transportation User Perception.

Keywords: filler, Portland cement, rice husk ash, hyacinth ash, marshall and wheel tracking.

1. INTRODUCTION

The South Tangerang City Government is one of the cities in Jabodetabek that has a transportation system development plan that will be directed at effective and sustainable regional spatial planning with efforts to increase regional productivity and efficiency of regional resources, through regulating the use of space for the main urban functions which include the system terminal transportation. Where the South Tangerang City Regional Regulation Number 15 of 2011 concerning the Regional Spatial Plan (RTRW) of South Tangerang City of 2011-2031 states the strategy for developing and improving transportation infrastructure based on integrated and controlled public transportation. In 2021, the new terminal development has realized only 2 terminals, namely the BSD type C terminal in Serpong District and the Pondok Cabe type A terminal in Pamulang District. Based on field observations, the condition of the terminal is empty of passengers, as seen from the lack of interest in the people of South Tangerang City in using buses as a means of transportation. From passenger data obtained from the South Tangerang City Transportation Service for the period January - December 2021, it can be seen the number of passengers coming and going from BSD. With the number of passengers less than 2500 people per month in the center of South Tangerang City, it is certainly necessary to evaluate the implementation of this terminal-based public transportation service. So that it can assist in developing other terminals in South Tangerang City.

2. MATERIAL AND METHOD

2.1 Research Area

South Tangerang City is one of the cities in Banten Province which is developing very rapidly. Directly adjacent to DKI Jakarta City, South Tangerang City is a good choice as a place to live and work. With a population of 1.7 million people and an area of 147.19 km2, it is one of the most densely populated cities in Indonesia. The majority of the community has a fairly high mobility because many work out of the South Tangerang City area. The BSD bus terminal is the first type C terminal built by the South Tangerang City Government in the Serpong area which was just inaugurated in March 2020, for the operation of this terminal it is managed by the South Tangerang City Transportation Service.

This terminal was built to serve the mobilization needs of the people of South Tangerang City as a realization of the mandate of Law 22 of 2009 concerning traffic and public transportation and the regulation of the Minister of Transportation No. 132/2015 concerning the operation of terminals and passenger transportation. The Serpong Terminal provides travel services within the city and between cities and between provinces. This terminal is able to mobilize the people of South Tangerang City who will go to Soekarno-Hatta airport or who will travel to Jakarta.

2.2 Method

According to Sugiyono (2018), the sample is part of the number and characteristics possessed by the population. The sample size was taken using the Hair Formula. The Hair formula is used because the population size is not known with certainty. According to Hair (2019) that if the sample size is too large, the method becomes very sensitive, making it difficult to obtain good goodness-of-fit measures. So it is suggested that the minimum sample size is 5-10 observations for each estimated parameter. With the number of indicators as many as 32

items and multiplied by 5 so that this study the number of samples was 160 people who came from Bus Terminal Users in South Tangerang City.

2.3 Research Variables

The research variable is something determined by the researcher studied carefully so that information is obtained in the form of data and processed with statistics so that conclusions can be drawn (Sujarweni and Endrayanto, 2012:23). A variable is a construct whose properties have been assigned values in the form of numbers, or concepts that have two or more values on a continuum. The value of a variable can be expressed by numbers or words. Variables can also be defined as factors that play a role in the events to be studied:

a) Independent Variables (X): Movement Characteristics (X1), Transportation Mode Facility Characteristics (X2) and Zone Characteristics (X3)

b) The dependent variable and as a mediating variable (Y1): User Satisfaction

c) Dependent variable (Y2): Public Transportation User Perception

2.4 Structural Equation Model (SEM) Based on Partial Least Square (PLS)

The research hypothesis was tested using a Structural Equation Model (SEM) approach based on Partial Least Square (PLS). PLS is a component or variance based structural equation model (SEM). Structural Equation Model (SEM) is a field of statistical study that can test a series of relationships that are relatively difficult to measure simultaneously. According to Santoso (2014) SEM is a multivariate analysis technique which is a combination of factor analysis and regression analysis (correlation), which aims to examine the relationship between variables that exist in a model, both between indicators and their constructs, or relationships between constructs.

According to Latan and Ghozali (2015), PLS is an alternative approach that shifts from a covariance-based SEM approach to a variance-based approach. Covariance-based SEM generally tests causality or theory, while PLS is more of a predictive model. However, the difference between covariance-based SEM and component-based PLS is in the use of structural equation models to test theories for prediction purposes.

PLS is a variant-based SEM statistical method designed to solve multiple regression when specific problems occur in the data (Jogiyanto and Abdillah, 2014). The purpose of PLS is to help researchers to get the value of latent variables for prediction purposes. According to Husein (2015) the data analysis using PLS – SEM is divided into three stages, outer model analysis, inner model analysis and hypothesis testing.

The outer model is often also called (outer relation or measurement model) which defines how each indicator block relates to its latent variable. This analysis is carried out to ensure that the measurement used is feasible to be used as a measurement (valid and reliable).

a) Convergent validity

Convergent validity testing of each construct indicator calculated by PLS (Partial Least Square). According to Ghozali (2014), an indicator is said to have good validity if it is greater than 0.70, while the loading factor value of 0.50 to 0.60 is considered sufficient.

b) Discriminant validity

Discriminant validity testing, reflective indicators can be assessed based on cross loading between indicators and their constructs. An indicator is declared valid if it has the highest loading factor value to the target construct compared to the loading factor to other constructs, then the latent construct predicts the size of their block better than the size of the other blocks.

c) Average variance extracted (AVE)

Another method to assess discriminant validity is to compare the square root of average variance extracted (AVE) of each construct with the correlation between the construct and other constructs in the model. Assessing the validity of a construct by assessing the AVE of each construct whose value is greater than 0.0

d) Composite reliability

Composite reliability testing aims to test the reliability of the instrument in a research model. The construct is declared to have good reliability, or the questionnaire used as a research tool is consistent, if the composite reliability and Cronbach alpha values of all variables are 0.70.

3. RESULT AND DISCUSSIONS

3.1 Characteristics of Respondents

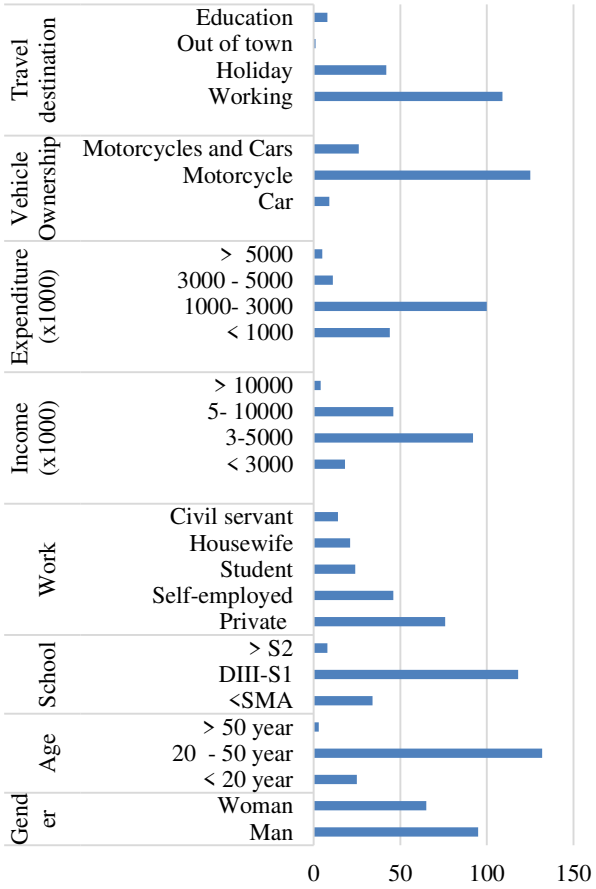

Figure-1. Characteristics of respondents.

3.2 Respondent's Perception Regarding the Location Where the Terminal Will Be Built

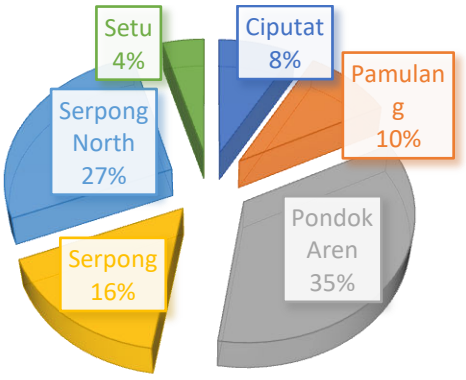

Figure-2. Respondent's perception regarding the location.

3.3 SEM Analysis Using Smart PLS Evaluation of the Outer Model 3.3.1

- **Validity Test**

Table-1. Validity test results.

Variable	Kode Item	Outer Loadings	Evidence
Movement	X1.1	0.910	Valid
	X1.2	0.902	Valid
	X1.3	0.864	Valid
	X1.4	0.897	Valid
	X1.5	0.879	Valid
Facilities Mode	X2.1	0.892	Valid
	X2.2	0.902	Valid
	X2.3	0.912	Valid
	X2.4	0.903	Valid
	X2.5	0.843	Valid
	X2.6	0.858	Valid
Zona	X3.1	0.899	Valid
	X3.2	0.907	Valid
	X3.3	0.891	Valid
	X3.4	0.876	Valid
User Satisfaction	Y1.1	0.895	Valid
	Y1.2	0.883	Valid
	Y1.3	0.899	Valid
	Y1.4	0.890	Valid
	Y1.5	0.880	Valid
	Y1.6	0.861	Valid
	Y1.7	0.789	Valid
	Y1.8	0.869	Valid
	Y1.9	0.860	Valid
Public Transportation User Perception	Y2.1	0.879	Valid
	Y2.2	0.834	Valid
	Y2.3	0.819	Valid
	Y2.4	0.916	Valid
	Y2.5	0.894	Valid
	Y2.6	0.846	Valid

- **Average Variance Extracted (AVE) Test**

Table-2. Average Variance Extracted (AVE) test result.

Variable	Average Variance Extracted (AVE)	Evidence
Movement	0.793	Valid
Facilities Mode	0.784	Valid
Zona	0.798	Valid
User Satisfaction	0.757	Valid
Public Transportation User Perception	0.749	Valid

- **Discriminant Validity Test**

Table-3. Discriminant validity test results.

	Movement	Facilities Mode of transportation	Zona	User Satisfaction	User Perception of Public Transportation
X1.1	0.910	0.350	0.554	0.571	0.655
X1.2	0.902	0.392	0.537	0.591	0.669
X1.3	0.864	0.354	0.544	0.577	0.633
X1.4	0.897	0.454	0.580	0.636	0.730
X1.5	0.879	0.324	0.527	0.542	0.650
X2.1	0.458	0.892	0.473	0.644	0.595
X2.2	0.350	0.902	0.494	0.628	0.564
X2.3	0.377	0.912	0.538	0.666	0.635
X2.4	0.366	0.903	0.512	0.658	0.577
X2.5	0.438	0.843	0.523	0.679	0.589
X2.6	0.234	0.858	0.382	0.558	0.466
X3.1	0.559	0.425	0.899	0.633	0.609
X3.2	0.581	0.491	0.907	0.662	0.673
X3.3	0.559	0.527	0.891	0.654	0.617
X3.4	0.503	0.536	0.876	0.655	0.601
Y1.1	0.582	0.648	0.655	0.895	0.736
Y1.2	0.624	0.683	0.677	0.883	0.736
Y1.3	0.573	0.663	0.685	0.899	0.766
Y1.4	0.575	0.636	0.652	0.890	0.717
Y1.5	0.560	0.592	0.581	0.880	0.669
Y1.6	0.534	0.642	0.597	0.861	0.624
Y1.7	0.527	0.551	0.534	0.789	0.603
Y1.8	0.569	0.661	0.666	0.869	0.727
Y1.9	0.592	0.584	0.641	0.860	0.693
Y2.1	0.677	0.559	0.590	0.656	0.879
Y2.2	0.613	0.533	0.569	0.665	0.834
Y2.3	0.628	0.533	0.617	0.681	0.819
Y2.4	0.674	0.629	0.666	0.769	0.916
Y2.5	0.656	0.591	0.639	0.708	0.894
Y2.6	0.651	0.517	0.550	0.688	0.846

- **Discriminant Validity Test (Fornell-Larcker Criterion)**

Table-4. Uji Discriminant Validity (Fornell-Larcker Criterion).

	Movement	Facilities Mode of transportation	Zona	User Satisfaction	User Perception of Public Transportation
Movement	0.891				
Facilities Mode of transportation	0.423	0.886			
Zona	0.617	0.554	0.893		
User Satisfaction	0.657	0.724	0.729	0.870	
User Perception of Public Transportation	0.751	0.649	0.700	0.803	0.865

- **Reliability Test**

Table-5. Composite reliability test results.

Variable	Composite Reliability	Evidence
Movement	0.950	Reliable
Facilities Mode of transportation	0.956	Reliable
Zona	0.940	Reliable
User Satisfaction	0.966	Reliable
User Perception of Public Transportation Transportasi Publik	0.947	Reliable

- **Cronbach's Alpha Test**

Table-6. Cronbach's Alpha Test Results.

Variable	Cronbach's Alpha	Evidence
Movement	0.935	Reliable
Facilities Mode of transportation	0.945	Reliable
Zona	0.916	Reliable
User Satisfaction	0.960	Reliable
User Perception of Public Transportation	0.933	Reliable

3.4 Inner Model (Structural Model)

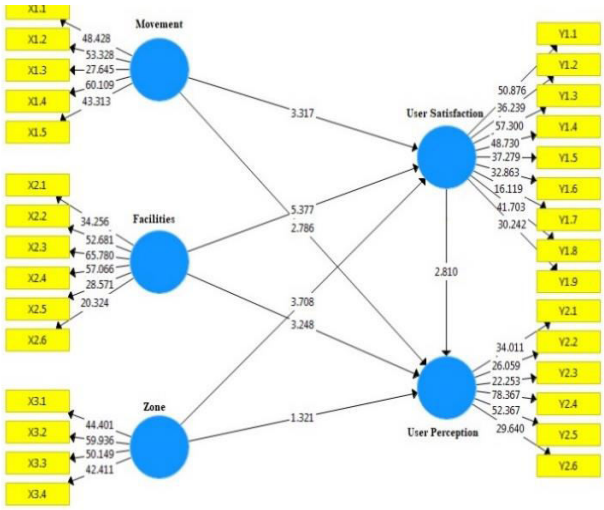

Figure-3. Inner model diagram (bootstrapping).

4. CONCLUSIONS

Based on the data that has been collected, processed and analyzed by researchers to answer the formulation and objectives of the research, it can be concluded that:

a) Characteristics of respondents are used to determine the diversity of terminal users in South Tangerang City, which are more domiciled in Pondok Aren (29%), with productive age 20-50 years (82.5%), male users are more (59%), education level D3-S1 (74%), income 3-5 million (58%), expenditure 1-3 million (62.5%), most private vehicle ownership is motorbike (78%), travel destination for work (68%) whatever terminal user perceptions related to the location where the terminal will be built, namely Pondok Aren (35%)

b) User satisfaction and perceptions of public transportation users are influenced directly or indirectly by the variables of movement, facilities and zones. Based on the results of the analysis, all

variables are acceptable and have a positive and significant effect, only the zone variable on user perception does not have a positive and insignificant effect on the perception of public transportation users because it has a p-value of 0.187> 0.05 and a t-statistic of 1 ,32 < 1.87 or in other words that the perception of terminal users in South Tangerang City is not affected by the zone or location, so wherever the terminal is, if there is demand from transportation users, it can be fulfilled.

c) The dominant variable in influencing the satisfaction of bus terminal users can be seen from the t-statistic value, the greater the value, the greater the effect. From the results of the analysis, it can be concluded that the facility has a large effect on user satisfaction with a t-statistic value of 5.377 > 1.87 or in other words that the facilities available at the terminal greatly affect the level of satisfaction of terminal users in South Tangerang City.

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