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The Satisfaction Analysis for the Performance of Public Transport Urban Areas

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Abstract:- The development of urban areas cause a variety of problems and challenges as a direct impact of the development conditions of the region, including in terms of planning adequate transportation system, which is able to meet the needs of urban population movements, not only in terms of the amount of means of transport, but also should pay attention to and improve performance of public transport services, strategies to improve the performance of public transport in satisfaction of public transport users, requires an understanding of the attitudes of public transport users, knowledge of user behavior will provide optimal results to improve the performance of public transport according to expectations and interests of public transport users.

This study aims to investigate the performance of public transport services, knowing the satisfaction of public transport users in terms of aspects of interest or societal expectations, determine the effect of the level of satisfaction of public transport services on the performance of public transport. This research method is a method of qualitative research, data analysis is used to determine the performance of public transport use Importance Performance Analysis (IPA) and know the satisfaction of users of public transport using the Customer Satisfaction Index (CSI), to examine the effect of satisfaction on the performance of public transport using Structural Equation Modeling (SEM).

The results showed that the performance of public transport remains low in providing services to the users of public transport. The main priority of the expectations or interests of public transport users to get treatment or improvement of public transport services is an indicator of accessibility, integration, capacity, smooth and fast, convenient, safety, easy, timely, orderly, efficient. Based on the calculation, the CSI value of 48.19% or 0.48 based on criteria CSI values were in the range from 0.35 to 0.50 (less satisfied) this means that the public transport user satisfaction index of the performance of public transport are less satisfied with the service transport general. Based on the results of SEM analysis of the influence of public transport user satisfaction (Y) on the performance of public transport (X) derived a mathematical equation Y = 0,873X + 0.022 indicates that the public transport user satisfaction has a positive and significant effect on the performance of public transport, any increase in public transport performance indicators it will also influence the increase in satisfaction of users of public transport.

Keywords: Public transportation, performance, satisfaction, expectations and interests.

I. INTRODUCTION

The needs of urban public transport services due to the increased activity are consequential movement in an urban population. Garling et al. (2002) said that the increased activity of the movement of the population will increase the demand for the use of public transport and the impact on the level of public transport services. To improve the public transport service in an urban area needs to be done to repair and handling of public transport in an integrated and systematic. Sezhian (2011) said that the public transport service is a measurement process or set of parameters specified, from the cost of the investment is used to achieve the planned objectives.
The analysis of the performance is a strategy to improve the service quality of public transportation systems. Strategies for improving the performance of public transport services and provide optimal results in operation required a revamping transportation system based on the characteristics of public transport services. Costa et al., (1997) said that the public transport service is very important in improving the quality of care and reduce the problems of urban transport systems. Beirao and Cabral (2007) stated that in order to improve the performance of public transport services in urban areas need a public transport user preferences to accommodate the required level of service user in performing the movement. Performance measurement is done in a variety of aspects, so as to make an effective decision. Nathanail (2008) says that in order to give satisfaction to the users of public

transport, required an operational review of the pattern of public transport services, as well as strategic decision making proper transportation system so as to improve the public transport service.

Performance of public transport is an operational assessment of service quality in providing satisfaction to the users of public transport. According Scheuning (2004) quality of service is the fulfillment of the expectations or requirements that compares the results with the expectations, the need to compare whether to accept a level of quality service. Olsen (2007) said that the public transport user satisfaction was related to the perceived quality of service, public transport users feel the quality of service, because each person tends to have a different assessment of the quality of public transport, and will continue to use public transport services if the feeling of satisfaction. Cronin and Taylor (1992) states that there is a positive relationship between service performance and satisfaction, satisfaction levels are influenced by the quality of service they receive, so that when the two components are met then it will give you satisfaction.

Meyer (2002) in his study stated that the performance of the transportation system services, user satisfaction indicators that affect the reliability of the public transport system, travel time, speed, security, delays, travel expenses. Cavana and Corbett (2007) states that satisfaction is an indicator that affect reliability, travel time and convenience, this indicator is very impact on customer satisfaction in travel. Meanwhile Andreassen and Lindestad (1998) state that consumer dissatisfaction public transportation system there are three main things to note are: cost, accessibility and station stops. Trynopoulos and Antoniou (2008) said that the provision of public transport and a range of public transport services is an indicator to give you the satisfaction of users of public transport, in addition to the waiting time and comfort, as well as easy to use public transportation is the most significant factor that directly affects the transport user satisfaction general.

Kostakis (2009) said that the development of urban transportation system requires a strategy to improve the performance of public transport in providing public transport user satisfaction. Strategies to increase the general user satisfaction requires a clear understanding of the behavior of public transport users, knowledge of user behavior will provide optimal results to improve satisfaction with public transport services beyond your expectation, besides the development of public transportation systems need to respond to market segmentation approach needs different populations. The level of interest and needs of each person are different due to the various activities undertaken population, therefore the transportation system planning process, different interests and needs must be known, because the needs of public transport users are dynamic and change over time.

Public transport user satisfaction research on the performance of public transport has been carried out by a variety of indicators or variables that affect satisfaction as indicators of comfort, safety and travel time. (Stone et al., 2001). Indicator of travel time, frequency, and reliability of public transport fare (Hensher and King, 2003; Tyrinopoulos and Aifadopoulou, 2008). The indicators of comfort and cleanliness of the vehicle (Eboli and Mazzulla, 2007; Swanson et al., 1997). Network coverage/distance to stop the vehicle (Tyrinopoulos and Antoniou, 2008). Safety indicators (Smith and Clarke, 2000; Fellesson and Friman, 2008). Urban transport systems are faced with the challenge of improving the performance of public transport in line with expectations or interests of public transport users. Therefore the problems and challenges of public transport are very important to note. Public transport must be able to deliver maximum performance, so as to give satisfaction to the users of public transport. Based on the description above analysis of satisfaction with the performance of urban public transport is very important to do research, so as to know the strengths and weaknesses of public transport services. The analysis of performance satisfaction of public transport is expected to provide a strategy to improve the performance of transit oriented towards satisfaction of urban public transport users.

II. METHODS OF STUDY

The research method of analysis of performance satisfaction urban public transport used is descriptive quantitative method quantitative descriptive study aims to accurately describe the properties of an individual, state, or the symptoms of a particular group, or influence in public relations. Analysis of the performance of public transport use Importance Performance Analysis (IPA) to investigate the performance of public transport, which is in accordance with the expectations of users of public transport. Analysis of transport user satisfaction using customer satisfaction index (CSI) is a measurement to determine the level of overall satisfaction with the approach that considers the interest rate or the expectations of public transport users. The analysis of the effect of satisfaction on the performance of public transport using Structural Equation Modeling (SEM) to determine the dominant variable. Structural testing using AMOS version 18.0 will convert the model specifications in structural equation and measurement equation of the model specification.

III. DATA ANALYSIS

Public Transport Performance

Performance assessment of public transport in this case public transport users will have the perspectives and interests of different according to what is perceived, in the study of public transport users to assess the indicators of public transport services, so the decision to be taken in order to improve public transport services urban is a desire or hope for public transport users. The method combines the science of measurement factors of importance and satisfaction level in two-dimensional graphics that facilitate explanation of data and gain practical proposals. The level of customer satisfaction translated into Cartesian diagram. Cartesian diagram consists of four quadrants that quadrant I (top priority), quadrant II (keep achievement), quadrant III, redundant, and quadrant IV (low priority). The results obtained from the calculation of the score and the importance weight kenerja public transport divided by the number of respondents, in this case the number of respondents is 384. The position of each indicator in the quadrant IPA can be shown in Table 1.

Table1. Position Indicator IPA

No	Indicator	Average Performance	Average Importance	Quadrant			
		$\bar{X}$	$\bar{Y}$	I	II	III	IV
	A	B	C	E	F	G	H
1.	Safety	2,67	4,63		√		
2.	Accessibility	2,21	4,63	√			
3.	Integrated	2,34	4,54	√			
4.	Capacity	2,24	4,48	√			
5.	Reguler	2,46	4,41			√	
6.	Fast and Quick	2,50	4,62		√		
7.	Easy	2,31	4,38				√
8.	On time	2,28	4,49	√			
9.	Comfortable	2,17	4,49	√			
10.	Achieved Tariff	2,66	4,07			√	
11.	Orderly	2,44	4,31			√	
12.	Safe	2,74	4,36			√	
13.	Low Pollution	2,57	4,35			√	
14.	Efficient	2,15	4,27				√
	avareage	2,41	4,43				

Table 1 presents the position indicator in the four quadrants of the Cartesian diagram with dividers is the average rate of interest and performance, the average interest rate of public transport users $4.43 and the average performance of public transport by 2.41. Assessment of the level of interest and performance in this case public transport users will have different perspectives according to what is perceived, in the study of public transport users to assess the performance indicators of public transport services, so the decision to be taken in a desire or expectation public transport users. Cartesian diagram will portray the line of intersection quadrant of the average value of the interest rate and the performance of public transport services with the aim to find out the specifics of each indicator is located on the quadrant in the Cartesian diagram. Treatment for each indicator based on the location of each quadrant in the Cartesian diagram, more Cartesian quadrant position indicator can be shown in Figure 1.

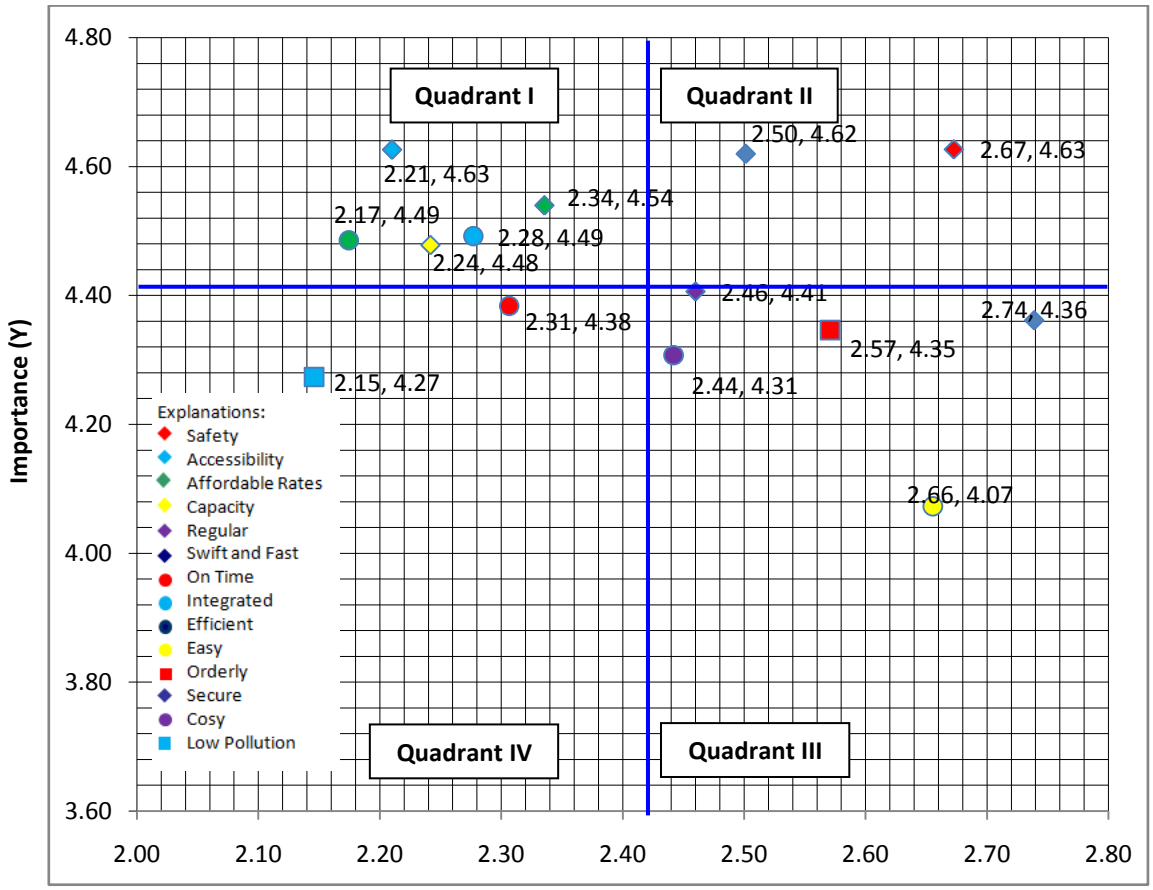

Figure 1. Cartesian diagrams IPA

Figure 1 presents the location of each quadrant indicator, the indicator function of grouping indicators to determine the priority in improving the performance of public transport, so as to give satisfaction to the users of public transport. The level of interest of users of public transport will vary, depending on the perception of each user after using public transport modes. The indicators of each quadrant are described as follows:

1. Quadrant I main priority (high expectations and low performance)

The indicator located in this quadrant is considered important by the users of public transport but in reality these factors have not been in line with expectations. Indicators that are considered important by the users of public transport accessibility, integration, capacity, timely and comfortable but the reality is not as expected. The indicators included in this quadrant should receive more attention or repaired so that the performance is increased.

2. Quadrant II maintain achievement (high expectations and high performance)

The indicator located in this quadrant is considered in accordance with the reality perceived by the users of public transport so that high levels of satisfaction. The indicators included in this quadrant must be maintained because the indicator has attracted the attention of users to utilize public transportation. Indicators of public transport services that can be maintained is safety, smoothly and quickly. These should be retained because it had been in accordance with the expectations of users of public transport.

3. Quadrant III, excessive (high performance low expectations)

The indicator located in this quadrant is considered less important by the users of public transport but in reality it is quite satisfactory. The indicators included in this quadrant are regular, affordable rates, orderly, safe, low pollution. Indicators were satisfactory but not so important by the users of public transport so that not too much attention or repaired, simply by adjusting the current conditions based on the needs of public transport users.

4. Quadrant IV low priority (low expectations and low performance).

The indicator located in this quadrant is considered less important by the users of public transport and in fact not too special. The indicators in this quadrant are easy and efficient. The increase in the indicator could be reconsidered as an influence on the perceived benefits of public transport users is very small.

Analysis of Public Transport User Satisfaction

Analysis using the public transport user satisfaction Customer Satisfaction Index (CSI) is used to determine the level of user satisfaction with the overall public transport to see the importance of public transport performance. The CSI analysis results, shown in Table 2.

Table 2. Matrix CSI Public Transport Services

No.	Indicator	Performance	Importance	Weight (WF)	Weight Score (WS)	CSI
		Y	X	B/ΣB	D x ΣC	E/5
	A	B	C	D	E	F
1.	Safety	4,63	2,67	0,075	2,52	50,40
2.	Accessibility	4,63	2,21	0,075	2,52	50,40
3.	Integrated	4,54	2,34	0,073	2,47	49,40
4.	Capacity	4,48	2,24	0,072	2,44	48,80
5.	Reguler	4,41	2,46	0,071	2,40	48,00
6.	Fast and Quick	4,62	2,50	0,074	2,51	50,20
7.	Easy	4,38	2,31	0,071	2,38	47,60
8.	On time	4,49	2,28	0,072	2,44	48,80
9.	Comfortable	4,49	2,17	0,072	2,44	48,80
10.	Achieved Tariff	4,07	2,66	0,066	2,22	44,40
11.	Orderly	4,31	2,44	0,069	2,34	46,80
12.	Safe	4,36	2,74	0,070	2,37	47,40
13.	Low Pollution	4,35	2,57	0,070	2,36	47,20
14.	Efficient	4,27	2,15	0,069	2,32	46,40
	Total	62,02	33,73		33,73	
	Average	4,43	2,41	CS Results Index		48,18

Table 2 shows that the value of CSI is 48.18% or 0.48 based on criteria CSI values were in the range from 0.35 to 0.50 (less satisfied) this means that the public transport user satisfaction index of the performance of public transport are less satisfied with the service public transport. Public transport users considered that public transport services currently not give satisfaction, therefore the necessary improvements to the public transport service indicators to improve the satisfaction of users of public transport.

Effect of Satisfaction on Performance Analysis of Public Transport

The effect of Satisfaction on Performance Analysis of Public Transport Structural Equation Modeling (SEM) with the help of Moment of Structural Analysis Software (AMOS) The model of structural relations is done after the structural model developed in the study in accordance with the observations and the data model of the structural suitability index. The purpose of testing the structural relationship model to determine the relationship between indicators of the latent variables or relationships among latent variables was designed in this study. Having obtained significant results of all indicators in the measurement model using confirmatory factor, for each latent variable in the analysis, then see the results of structural models to address the hypothesis that the way down. Based on the structural model testing framework, then in general there are two sub-structural relationships that will be tested in this study, the effect of satisfaction on the performance shown Figure 2.

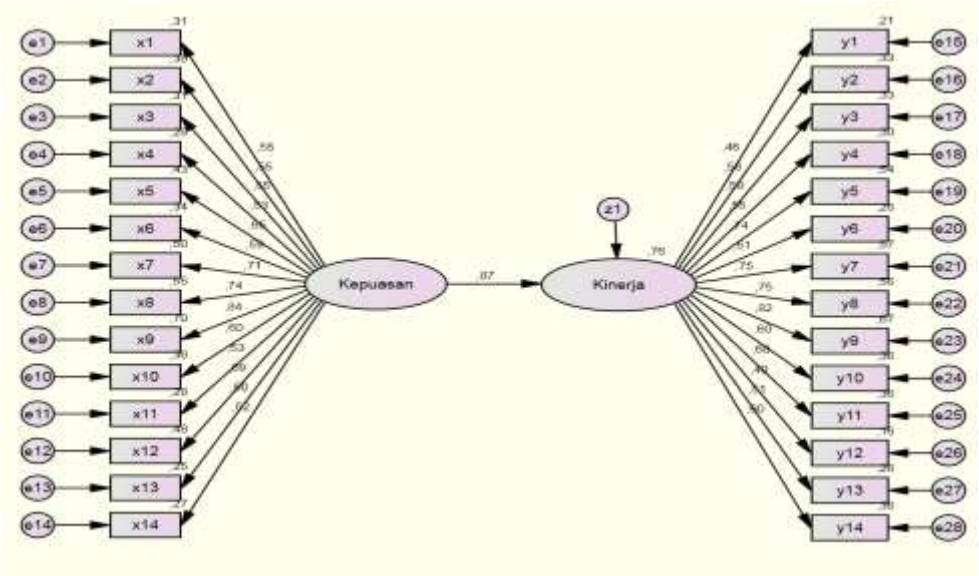

Figure 2. Diagram of a full model

Figure 2 shows that there is a relationship between the latent variables and the influence of exogenous variables on endogenous variables. The results of the analysis of experimental data showed that the relationships built in this study had a positive and significant relationship. The structural model above shows structural relationships in addition to the latent variables, also describes the relationship with the latent variable and the observed variable measurement error of each observed variable. The results of the analysis of the structural model built suitability as a basis for analyzing the relationship between latent variables by the value of the standardized regression weights in order to know the relationship between latent variables and relationships signifingkansi levels shown in Table 3.

Table 3. Standardized Regression Weights Direct Effects of Latent Variables

			Estimate	C.R	P	Z (error)	Expalanation
Satisfaction	⟶	**Performance**	**0,873**	**8,652**	**0,000**	**0,022**	**Significant**

The estimation results of the standardized regression weights, it can be seen the effect coefficient, cr (critical ratio) is equal to the t-test on regression analysis and probability levels respectively direct relationship between latent variables. Table 4.58 and the Figure 4.33 shows that there is a direct relationship satisfaction of users of public transport have a significant effect on the performance of public transport. Based on the results of SEM analysis, the influence of public transport user satisfaction (Y) on the performance of public transport (X) obtained the value of Y = 0.873, so it can be expressed mathematically in the following equation:

Y = 0,873X + 0,022

Where:

X = Perfomance

Y = Satisfaction

e = variabel error

Based on the above equation shows that the estimated values for the performance was positive, amounting to 0.873 this means that public transport user satisfaction has positive influence on the performance of public transport.

IV. CONCLUSION

Performance of public transport remains low in providing services to the users of public transport. The main priority of the expectations or interests of public transport users to get treatment or improvement of public transport services is an indicator of accessibility, integration, capacity, on time, comfortable. Public transport user satisfaction index to the unsatisfactory performance of public transport, public transport users generally considered that in general the existence of public transportation not provided with a good service. Public transport user satisfaction has a positive and significant effect on the performance of public transport, any increase in public transport performance indicators will also influence the increase in public transport user satisfaction.

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