Passenger Satisfaction Measurement with a SERVQUAL Approach and Proposed Improvements to Non Bus Rapid Transit (BRT) Transjakarta Services Poris Plawad Route – Senayan Bundaran

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Abstract. Developing countries tend to have problems in the form of people often encountering the phenomenon of congestion. Public transportation is one of the assessments of the quality level of development of an area or country. The government continues to try to unravel the phenomenon of congestion that occurs. One of the modes of public transportation in the capital and surrounding areas is Transjakarta, a bus that has many stops spread across each area and is integrated, providing users convenience in mobilizing from one place to another. One of the lines in the area near the capital, namely the Tangerang area, there is a route from the city near Jakarta that takes users to Jakarta, namely the Non- Rapid Transit type, the Poris Plawad – Senayan roundabout route. Measurement of Servqual (service quality) shows that this route transportation service is not satisfactory at the level of importance based on user ratings which include Tangible, Reliability, Responsibility, Empathy and Assurance. The biggest factor is related to reliability 1 regarding punctuality, reliability 2 regarding the range of bus arrivals, reliability 3 regarding the availability of appropriate shelters and responsibility 4 regarding the availability of sufficient fleets to accommodate passengers. The results of the research on the four main points, the company should review the departure scheduling system by shortening the time span between arrivals or considering adding to the fleet, as well as carrying out maintenance and repairs on the operated shelters.

Keywords: Service Quality (Servqual L) · Customer satisfaction · Importance Performance Analysis (IPA)

1 Introduction

Bus Rapid Transit as known as Transjakarta, is a type of transportation that has been implemented and developed for several years in the capital city of Jakarta and its surroundings, such as Tangerang, Bekasi and so on.

The government has served passengers through various supporting facilities for the operation of transportation using Transjakarta, which not only operates in the capital city, but also operates in urban areas around Jakarta. In this case, buses provided from cities around Jakarta are known as non-bus rapid transit or non-BRT whose function is as a feeder bus to ride Transjakarta buses operating in Jakarta, although not as many as those operating in their hometown.

The increasingly widespread promotion of non-BRT Transjakarta certainly increases public interest in switching from using private vehicles to using public transportation. This includes non-BRT Transjakarta which operates from Tangerang City, as a city directly adjacent to the Capital City, to Jakarta, as well as from Jakarta to Tangerang. It can be seen how crowded the queues are and in non-BRT Transjakarta which operates from Tangerang-Jakarta which serves the Poris Plawad-Senayan roundabout route (Code T11). The purpose of this study is to analyze the level of customer satisfaction and provide solutions to existing problems using the SERVQUAL method.

2   Methods

2.1   Data Collection Methods

The research method uses SERVQUAL with the research stages depicted graphically in the visualization of the process carried out in the research. (See Fig. 1).

2.2   Data Processing

The initial stage of the research begins with determining the problem based on existing events as well as personal and customer experiences when boarding the Transjakarta non-BRT route Poris Plawad-Senayan Roundabout, namely customer satisfaction with service quality against customer expectations. The next stage is to collect data by filling out the SERVQUAL aspect questionnaire regarding customer expectations and customer satisfaction assessments of the quality of existing services for pre-test to test the validity and reliability.

The next stage is when the test results of the pre-test data are obtained that the questionnaire is valid and reliable, then the main data collection is carried out for research.

Based on the results of filling out the questionnaire, then the data is processed using the SERVQUAL method and Importance Performance Analysis which can then be obtained which aspects have met customer expectations and which have not met customer expectations.

In this study, the instrument used was a questionnaire that adapted and developed the research instrument conducted by Parasuraman in Tjiptono (2014) and adjusted the object in this study. The questionnaire in this research contains 25 statements covering the five dimensions of SERVQUAL as the main subject.

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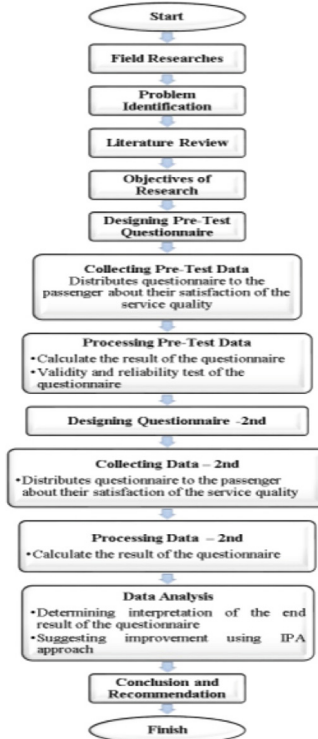
Fig. 1. Research Flowchart

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Table 1. Questionnaire Items SERVQUAL

Code	Contents
TAN1	Directions that are traversed using the latest technology
TAN2	Audio that informs the bus stop that will be going soon
TAN3	Application on a smartphone to monitor the presence of the bus
TAN4	Decent seat condition
TAN5	Availability of call center number information in case of disturbance
TAN6	The officers are neatly dressed and in full uniform
REL1	Fleet arrived on time
REL2	Time range between bus arrivals
REL3	There is clear and communicative information about the bus stop to be addressed
REL4	Driving speed according to the given rules (max. 50km/h)
REL5	Priority seats available
REL6	Availability of decent stops to wait for the bus to arrive
REL7	The condition of the bus is clean and has fragrance
RES1	Officers help passengers who have difficulty boarding the bus
RES2	Officers answer questions when there are passengers who ask
RES3	Officers provide relevant information when passengers ask
RES4	The number of fleets is sufficient to accommodate passengers
EMP1	The use of priority seats is appropriate according to the rightful
EMP2	Willingness of officers to serve passengers
EMP3	Precisely the information submitted by the officer
EMP4	Officers are friendly with passengers
ASR1	The officers are friendly, polite and courteous in communicating with passengers
ASR2	Passengers feel safe on the bus
ASR3	Passengers trust the bus driver to drive according to the rules.
ASR4	Availability of fire extinguishers, emergency glass breaker and first aid kit on the bus

(Source: Data Processing)

3   Result and Discussion

The following are the results of data collection and data processing regarding the measurement of customer satisfaction for Transjakarta non-BRT routes Poris Plawad-Senayan roundabout (Code T11).

3.1 Processing with Multiple Linear Regression

To find out the relationship between the assessment of the level of importance to the level of satisfaction/performance aspects according to the respondents based on real conditions, a test was carried out based on the multiple linear regression method using SPSS software. The following results were obtained (Figs. 2 and 3).

Then after the coefficient of determination and significance test, the parameter significance test was also carried out using SPSS software with the following results (Fig. 4).

There is an influence between the level of importance according to the customer and the level of satisfaction felt by the customer, based on testing using multiple linear

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,516ᵃ	,267	,229	,477482	,267	7,195	5	99	,000

a. Predictors: (Constant), Assurance, Responsibility, Tangible, Empathy, Reliability

Fig. 2. Coefficient of Determination (Source: Data Processing)

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8,202	5	1,640	7,195	,000ᵇ
	Residual	22,571	99	,228		
	Total	30,773	104			

a. Dependent Variable: Performance

b. Predictors: (Constant), Assurance, Responsibility, Tangible, Empathy, Reliability

Fig. 3. Simultaneous Significance Test

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,671	,823		2,030	,045
	Tangible	,373	,143	,244	2,603	,011
	Reliability	,700	,179	,421	3,914	,000
	Responsibility	-,415	,142	-,302	-2,922	,004
	Empathy	,309	,121	,259	2,553	,012
	Assurance	-,456	,130	-,357	-3,503	,001

a. Dependent Variable: Performance

Fig. 4. Parameter Significance Test

regression, where the coefficient of determination and significance test shows that the attributes of interest (Tangible, Reliability, Responsibility, Empathy and Assurance) affect the level of customer satisfaction. Towards service. Transjakarta non-BRT route Poris Plawad-Senayan roundabout.

3.2   Processing with SERVQUAL

As for the assessment of the level of importance and the level of satisfaction/performance aspects according to the respondents based on real conditions, calculations were carried out based on the SERVQUAL (Service Quality) method where the value of each SERVQUAL dimension was calculated both in terms of importance and performance. The customer assessment of the importance value of the SERVQUAL aspects is contained in Table 2.

The customer assessment of the performance value of the SERVQUAL aspects is contained in Table 3.

After obtaining the importance and performance scores, then the SERVQUAL score is calculated, namely the performance score minus the importance score, where the results are presented in Table 4.

3.3   Processing with SERVQUAL

After obtaining the scores for each attribute and dimension, these scores can be positioned in the science matrix. The IPA matrix is used to provide answers to responses such as what should be done to each aspect both in attributes and dimensions.

In the IPA matrix there are four quadrants, where the quadrant numbering in the IPA matrix is based on research by Sunitiya Thuannadee (2011), namely quadrant one shows top priority, quadrant two indicates maintain achievement, quadrant three indicates low priority, and quadrant four indicates excessive performance. Its depiction in the IPA matrix is as follows. Then the data is plotted into the IPA matrix based on the attributes and dimensions.

Based on Fig. 5, it is known that each attribute occupies a different position, which is as follows.

- Attribute 1 is with the code TAN1, regarding the path indicator traversed by using the latest technology is located in quadrant IV which shows excessive performance, where this attribute is considered not too important by respondents but the performance/performance is satisfactory.
- Attribute 2, which is coded TAN2, regarding the audio that provides information on the bus stop that will be immediately addressed is located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.
- Attribute 3 is coded TAN3, regarding the application on a smartphone to monitor the presence of the bus located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.

Table 2. Service Aspect Importance Score

No	Code	Interest Score		Dimention
		Attribute	**Dimention**	
1	TAN1	4.2381	4.4841	*Tangible*
2	TAN2	4.6762		
3	TAN3	4.6286		
4	TAN4	4.5619		
5	TAN5	4.5619		
6	TAN6	4.2381		
7	REL1	4.8571	4.5946	*Reliability*
8	REL2	4.7524		
9	REL3	4.6762		
10	REL4	4.1333		
11	REL5	4.6286		
12	REL6	4.6476		
13	REL7	4.4667		
14	RES1	4.5143	4.5452	*Responsibility*
15	RES2	4.4667		
16	RES3	4.5429		
17	RES4	4.6571		
18	EMP1	4.6762	4.4524	*Empathy*
19	EMP2	4.6095		
20	EMP3	4.5714		
21	EMP4	3.9524		
22	ASR1	4.3905	4.5476	*Assurance*
23	ASR2	4.6571		
24	ASR3	4.5524		
25	ASR4	4.5905		
	Totally		**4.5248**	

(Source: Data Processing)

- Attribute 4 is coded TAN4, regarding the condition of a decent seat located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.
- Attribute 5, which is coded TAN5, regarding the availability of call center number information in the event of a disturbance is located in quadrant II, which shows maintaining performance, where this attribute is considered very important by respondents and the performance is very satisfactory.

Table 3. Service Aspect Performance Score

	Code	Performance Score		Dimention
		Attribute	**Dimention**	
1	TAN1	4.0381	4.0587	*Tangible*
2	TAN2	3.8857		
3	TAN3	4.1143		
4	TAN4	4.1905		
5	TAN5	4.0571		
6	TAN6	4.0667		
7	REL1	3.2667	3.6014	*Reliability*
8	REL2	2.619		
9	REL3	3.8		
10	REL4	3.9048		
11	REL5	4.2476		
12	REL6	3.2952		
13	REL7	4.0762		
14	RES1	4.1524	4.0024	*Responsibility*
15	RES2	4.1619		
16	RES3	4.2952		
17	RES4	3.4		
18	EMP1	3.8571	4.0333	*Empathy*
19	EMP2	4.181		
20	EMP3	4.1905		
21	EMP4	3.9048		
22	ASR1	4.0667	4.1643	*Assurance*
23	ASR2	4.2286		
24	ASR3	4.2095		
25	ASR4	4.1524		
	Totally		**3.9720**	

(Source: Data Processing)

- Attribute 6, which is coded TAN6, regarding officers who look neat and in complete uniform, is located in quadrant IV, which shows excessive performance, where this attribute is considered not too important by respondents but the performance/performance is satisfactory.
- Attribute 7, which is coded REL1, regarding the fleet arriving on time, is located in quadrant I, which shows top priority, where this attribute is considered very important by respondents but the performance is not satisfactory.

Table 4. SERVQUAL Score Service Aspect

No.	Code	Score SERVQUAL		Dimention
		Attribute	**Dimention**	
1	TAN1	−0.2000	−0.4254	*Tangible*
2	TAN2	−0.7905		
3	TAN3	−0.5143		
4	TAN4	−0.3714		
5	TAN5	−0.5048		
6	TAN6	−0.1714		
7	REL1	−1.5904	−0.9932	*Reliability*
8	REL2	−2.1334		
9	REL3	−0.8762		
10	REL4	−0.2285		
11	REL5	−0.381		
12	REL6	−1.3524		
13	REL7	−0.3905		
14	RES1	−0.3619	−0.5429	*Responsibility*
15	RES2	−0.3048		
16	RES3	−0.2477		
17	RES4	−1.2571		
18	EMP1	−0.819	−0.419	*Empathy*
19	EMP2	−0.4286		
20	EMP3	−0.381		
21	EMP4	−0.0476		
22	ASR1	−0.3238	−0.3833	*Assurance*
23	ASR2	−0.4286		
24	ASR3	−0.3429		
25	ASR4	−0.4381		
	Totally		**−0.5528**	

(Source: Data Processing)

- Attribute 8 is coded REL2, regarding the time span between bus arrivals located in quadrant I, which shows the main priority, where this attribute is considered very important by respondents but the performance is not satisfactory.
- Attribute 9 is code REL3, regarding the existence of clear and communicative information about the bus stop to be addressed is located in quadrant II which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.
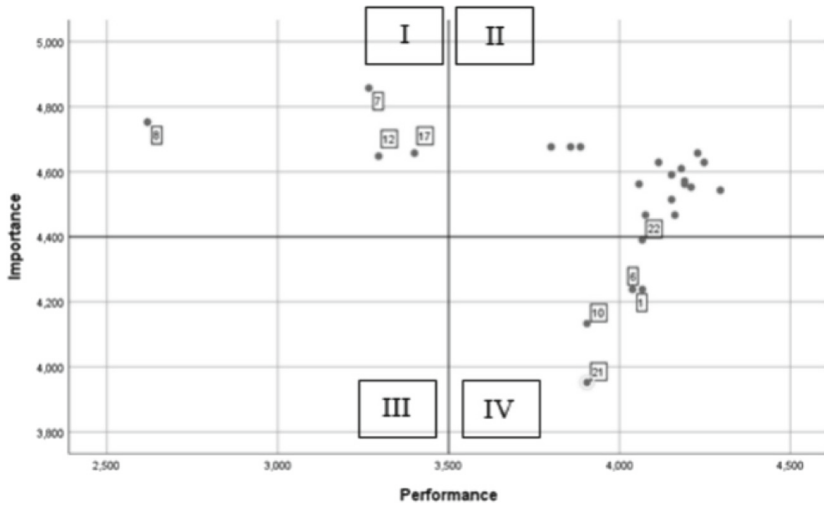
Fig. 5. IPA Matrix by Attribute (Source: Data Processing)

- Attribute 10, which is code REL4, regarding driving speed according to the given rules (max. 50km/hour) is located in quadrant IV which shows excessive performance, where this attribute is considered not too important by respondents but the performance is satisfactory.
- Attribute 11 is coded REL5, regarding the availability of priority seats located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.
- Attribute 12 is coded REL6, regarding the availability of a decent bus stop to wait for the arrival of the bus, which is located in quadrant I, which shows top priority, where this attribute is considered very important by respondents but the performance is not satisfactory.
- Attribute 13, which is coded REL7, regarding the condition of the bus being clean and containing fragrance, is located in quadrant II, which indicates maintaining achievement, where this attribute is considered very important by respondents and the performance/performance is very satisfactory.
- Attribute 14, which is coded RES1, regarding officers helping passengers who have difficulty boarding the bus, is located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance/performance is very satisfactory.
- Attribute 15 is coded RES2, regarding the officer answering questions when there are passengers who ask questions, it is located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.
- Attribute 16, which is coded RES3, regarding officers providing relevant information when passengers ask questions is located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.

- Attribute 17 is coded RES4, regarding the number of fleets sufficient to accommodate passengers is located in quadrant I, which shows the main priority, where this attribute is considered very important by respondents but the performance is not satisfactory.
- Attribute 18 is coded EMP1, regarding the use of priority seats, according to the right, which is located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance/performance is very satisfactory.
- Attribute 19, which is coded EMP2, regarding the willingness of officers to serve passengers lies in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.n.
- Attribute 20 is coded EMP3, regarding the exact information submitted by the officer is located in quadrant II, which shows maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfying.
- Attribute 21, which is coded EMP4, regarding officers being familiar with passengers is located in quadrant IV, which shows excessive performance, where this attribute is considered not too important by respondents but the performance is satisfactoryn.
- Attribute 22, which is coded ASR1, regarding officers being friendly, polite and courteous in communicating with passengers is located in quadrant IV, which shows excessive performance, where this attribute is considered not too important by respondents but the performance is satisfactory.
- Attribute 23, which is coded ASR2, regarding Passengers feeling safe on the bus, is located in quadrant II, which indicates maintaining achievement, where this attribute is considered very important by respondents and the performance is very satisfactory.
- Attribute 24, which is coded ASR3, regarding Passengers trusting the bus driver to drive according to the rules, is located in quadrant II, which shows maintaining performance, where this attribute is considered very important by respondents and the performance is very satisfactory.
- Attribute 25, which is coded ASR4, regarding the availability of extinguishers, emergency glass breaker and first aid kits on the bus is located in quadrant II, which indicates maintaining performance, where this attribute is considered very important by respondents and the performance is very satisfactory.

Meanwhile, based on Fig. 6, it is known that each dimension occupies a different position, which when described per quadrant is as follows.

- Dimension 1, which is Tangible, is located in quadrant IV, which shows excessive performance, where this dimension is considered not too important by respondents but the performance is satisfactory.
- Dimension 2, namely Reliability, is located in quadrant I, which shows the main priority, where this dimension is considered very important by respondents but the performance is not satisfactory.
- Dimension 3, namely Responsibility lies in quadrant II, which shows maintain achievement, where this dimension is considered very important by respondents and the performance/performance is very satisfying.
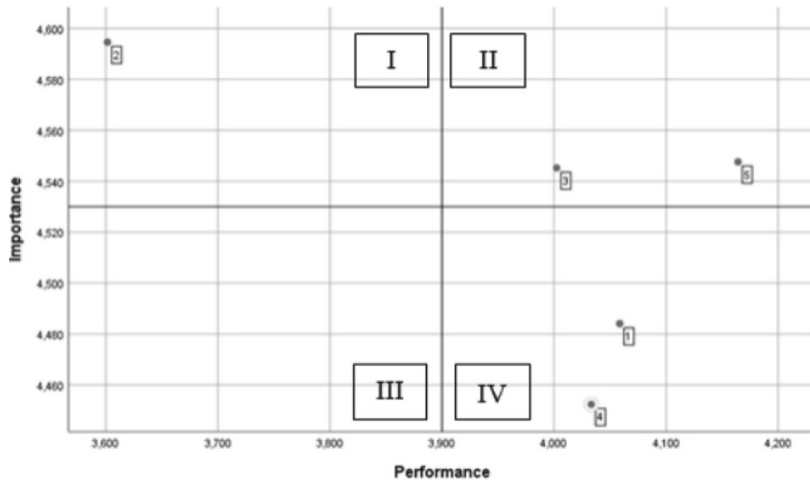
Fig. 6. IPA Matrix by Attribute (Source: Data Processing)

- Dimension 4, namely Empathy, is located in quadrant IV, which shows excessive performance, where this dimension is considered not too important by respondents but the performance is satisfactory.
- Dimension 5, namely Assurance, is located in quadrant II, which shows maintaining achievement, where this dimension is considered very important by respondents and the performance is very satisfactory

4   Conclusion

The analysis is a continuation of the previous stage which contains data collection and processing, calculation of statistical tests and interpretation of experimental results (Suwandi, 2012). Based on the results of processing the SERVQUAL score, the overall importance score was 4.5248 and the overall satisfaction/performance score was 3.9720, so that the difference between the satisfaction score and the importance score was -0.5528. This value indicates that the customer's wishes have not been fulfilled for Transjakarta services on the Poris Plawad-Senayan roundabout route.

The data from the processing with SERVQUAL is then used as input for the IPA matrix in knowing which quadrant group from each attribute and dimension. In the IPA matrix based on dimensions, it is known that quadrant I is occupied by the Reliability dimension, which means that this dimension requires quality improvement. Meanwhile, the Responsibility and Assurance dimensions are in quadrant II, which means that the performance has fulfilled the interests of the customer.

In the results of processing on the IPA matrix based on attributes, there are four attributes contained in quadrant I, which means that these attributes are the main priorities that require quality improvement.

Based on the decisions from the previous discussion regarding the main priorities, as well as from the results of plotting on the IPA matrix in Fig. 2, four aspects are obtained

that are in quadrant one which indicates that improvements are needed. These items include the REL1 code regarding the fleet arriving on time, the REL2 code regarding the time span between bus arrivals, the REL6 code regarding the availability of appropriate stops to wait for the bus arrival, and the RES4 code regarding the number of fleets sufficient to accommodate passengers.

- For the improvement of the main priority aspects, the following priorities are carried out:
- Reviewing the departure scheduling system
- Re-aligning fleet departures with the app
- Shorten the range of departure times between fleets
- Addition of fleet operated
- Optimizing available bus stops
- Improve the cleanliness of the available shelters.

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