Analysis of the Level of Consumer Satisfaction with the JR Connexion Bus Transportation Service on the Cibubur - Blok m route

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Abstract

This study aims to determine the level of performance, the level of consumer satisfaction with the services provided by the JR Connexion Bus route Kota Wisata Cibubur - Blok M and to determine the physical condition of the JR Connexion Bus. The research method was carried out by collecting primary data and secondary data by conducting on-bus surveys which included load factor, headway, frequency, travel speed, travel time, service time, passenger waiting time and number of vehicles operating. For service performance and satisfaction, it is analyzed based on the Standards of the Directorate General of Transportation, as well as service data which is then analyzed using qualitative and quantitative analysis methods. Regarding the extent to which the quality of performance and service level of passenger satisfaction with the JR Connexion Bus route Cibubur - Blok M is used Importance Performance Analysis (IPA). Then tested the effect of service performance with the level of customer satisfaction using the Chi-Square (X^2) formula. Based on the results of the analysis, it was concluded that the operational performance of the JR Connexion Bus for the Cibubur - Blok M tourist city route according to the Directorate General of Land Transportation was in the "Good" category with an overall value of 19 points (18-24 points). And the results of the questionnaire refer to the 5 dimensions regarding the level of service performance getting a good score (4.16) and the level of satisfaction getting a satisfied score (4.13).

Keywords
Importance Performance Analysis, JR Connexion Bus, Operational Performance, Performance Level, and Satisfaction Level.

1. Introduction

In the history of human development towards the development of cities, we can see that humans have always wanted to travel from one place to another for their needs. In this case, humans really need a means of transportation called public transportation. Transportation is the process of moving an inanimate or living object from one place to another, which requires transportation in every activity. Good transportation really determines the development of an area, because it can facilitate the movement of people, goods, services and information from one area to another.

The need for transportation facilities in the city of Cibubur from time to time continues to increase due to the increasing number of activities that require transportation services so that the intensity of traffic movements in the city of Cibubur also increases. Congestion is a problem that cannot be avoided, this is caused by the dense number of vehicles or the number of private vehicles crossing a road segment. One way to solve this problem is to improve public transportation facilities and infrastructure. Service users want transportation services that are safe, comfortable, and fast. Therefore, based on these problems, a study was conducted to analyze the level of service satisfaction on the JR Connexion Bus with the Kota Wisata Cibubur – Blok M route.

Figure 1. JR Connexion Bus

2. Literature review

Transportation is the process of moving an inanimate or living object from one place to another, which requires transportation in every activity. Good transportation really determines the development of an area, because it can facilitate the movement of people, goods, services and information from one area to another. In this case, humans really need a means of transportation called transportation. The need for transportation services for people in urban areas is usually served by public transportation. The public's negative perception of public transportation is one of the causes of the high number of private vehicle users, but over time, more and more private vehicle users continue to cause several problems in the transportation sector. The number of transportation problems is combined with the variable of population growth that continues to increase, the number of motorized vehicles that exceeds road capacity, and the behavior of people who still ignore traffic regulations on the highway. Among these various problems will cause traffic jams, high accident rates, and various other community problems. For problems caused by private car users, one of the efforts made is to improve the public transportation system in Indonesia.

2.1. Operational Standards of Service Performance of the Directorate General of Land Transportation

There are several elements that can be used as a reference and describe the expected characteristics of transportation as determined by the government in this case the Ministry of Transportation (SK.22.AK.005/UAKB/2012) concerning Minimum Service Standards for Bus Transportation Service Users both in terms of quantity and transportation quality, as shown in the following table:

Table 1. Standard Operational Service Performance

No	Indicator	C	B	A
1	Load Factor at peak hours	>1	0.8-1	<0.8
2	Load factor at off-peak hours	>1	0.7-1	<0.7
3	Travel Speed (km/h)	<5	05-10	>10
4	Delivery time / Headway (minutes)	>15	05-10	<10
5	Travel Time (minutes/km)	>12	06-12	<6
6	Service Time (hours)	<13	13-15	>15
7	Frequency	<4	04-06	>6
8	Number of Operating Vehicles (%)	<82	82-100	>100
9	Passenger Waiting Time (minutes)	>30	20-30	<20
10	Beginning and End of Service Time	5-18	5-20	5-20

Information:
Total score: >24 = Very good
Total score 18-24 = OK
Total value 12-17 = Medium
Total value < 12 = Not good

a. Load factor

It is the ratio of the number of public transport users to the available seating capacity of a particular vehicle or public transport.

The formula for calculating the load factor is:

$$\text{Load factor} = \frac{\text{Total passenger}}{\text{Passenger seat capacity}} x\ 100\%$$

b. Headway

Is the time between one vehicle and another vehicle that is loaded behind it on one route, or the difference in arrival time between one vehicle and the next vehicle, usually at a bus stop (in minutes).

c. Traveling time

It is the travel time from the starting point of the route to the end point of the route.

Operation time is obtained based on the results of a field survey (on-bus).

d. Service Time

Is the time during which the vehicle in a route is still operating. The time is calculated from the start of the vehicle operating to the last time the vehicle operates.

e. Travel Speed

Average vehicle speed from the starting point of departure to the end point of the route. The formula for calculating speed is:

$$V = \frac{s}{t}$$

Where :
V = Speed (km/h)
S = Distance (km)
T = Time (hours)

f. Vehicle Frequency

The number of departing vehicles that pass at a certain point in units of vehicles. The frequency of vehicles will affect the waiting time of passengers. The frequency of public transportation depends on the number of passengers who will use the transportation.

The vehicle frequency value can be calculated by the formula:

$$F = \frac{60}{N}$$

Where:
F = Vehicle frequency (vehicles/hour)
N = Number of vehicles

g. Number of vehicles operating

Percentage of the number of vehicles operating with the number of vehicles permitted by the government to operate.

The formula for calculating the number of vehicles in operation is:

$$\text{Number of vehicles operating} = \frac{number\ of\ vehicles\ operating\ 1\ day}{Number\ of\ vehicle\ fleet} \times 100\%$$

h. Passenger waiting time

It is the time required by passengers from the point of departure to getting the transportation.

2.2. Questionnaire

Questionnaire is a list of written questions from researchers addressed to research subjects directly or indirectly to collect data needed by researchers. This method is very good because it can determine the level of performance and satisfaction level on the JR Connexion bus quickly, precisely and efficiently. The type of questionnaire used in this study is a closed questionnaire. Sampling technique is used before distributing the questionnaire by using the formula:

$$n = \frac{N}{1 + N\ (e)^2}$$

Information:
N = Total population
n = Number of samples
e = percent inaccuracy leeway 10%

2.3. Test data

1. Validity test

Validity testing is a test carried out to determine the validity of a questionnaire in collecting data, the questionnaire can be said to be true if the questionnaire instrument is able to reveal something that will be measured by the questionnaire. The data inputted is the assessment of the performance factor or variable X and the satisfaction factor or variable Y by comparing the calculated R value and the R table value obtained from the questionnaire data analysis. If R count is greater than R table then each question is said to be valid.

2. Reliability test

Reliability testing was carried out to determine whether the questionnaire that had been used in this study showed a level of precision and accuracy. Reliability testing is done by testing the instrument only once. Then analyzed using Cronbach's Alpha method. If the value of Cronbach's Alpha > 0.60 then it is reliable or consistent.

2.4. Importance Performance Analysis

In analyzing the satisfaction level of the JR Connexion Bus, the researcher uses the IPA (Importance Permormace Analysis) method. Importance Performance Analysis is used to measure a person's level of satisfaction with the performance of others. With the formulation of the problem regarding the extent to which the level of customer satisfaction with the performance of the JR Connexion Bus. Processing of statistical data obtained during the study using the SPSS (Statistical Package for the Social Sciences) application. After knowing the average calculation of the performance appraisal and passenger satisfaction, then we can then see

the description of the position of the service quality factors studied on the Cartesian diagram which is divided into 4 parts, namely Quadrants A, B, C, and D.
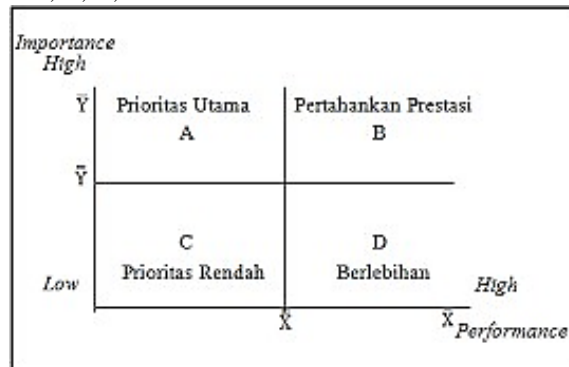

Figure 2. Cartesian diagram

Quadrant A shows the main priority that the value of service performance and the value of passenger satisfaction is above average, Quadran B shows maintain achievement that service performance is below average but the value of passenger satisfaction is above average, Quadran C shows Low Priority that the value of service and the value of expectation/satisfaction equally low, Quadran D shows excessive that the expected value is below the average and the service value is above the average.

3.Research methodology

The research method is an activity carried out to carry out a research to be studied. The methods used in this final project are survey methods, qualitative and quantitative research. The data collection used in this research is primary data and secondary data. Primary data collection was carried out by conducting a direct survey in the field for 3 days, namely on weekdays and holidays. The types of surveys carried out are by means of observation, interviews, documentation and questionnaires (on-bus). Secondary data is a collection of data and information obtained from institutions and agencies related to supporting data taken in the field. In this case, the secondary data needed are operational data and a map of the JR Connexion Bus route.

4. Results and Analysis

4.1. JR Connexion Bus Operational Performance Results

Based on the results of the analysis, it was identified the operational performance of the JR Connexion Bus Route City Tour Cibubur - Blok M, to obtain primary data carried out according to survey procedures. The following are the results of the analysis obtained during the survey.

Table 2. Operational Performance Results

Indicator	Category	Weight
Load Factor at peak hours	A	3
Time between (Headway)	C	1
Frequency	C	1
Travel time	A	3
Travel speed	A	3
Service time	B	2
Number of vehicles operating	B	2
Passenger waiting time	B	2
Start and end of service time	B	2
Total		19
Operational Performance Assessment		Well

4.2. Questionnaire Processing

The next step after getting 100 respondents to the questionnaire is to test the validity and test reliability. The valid and reliable nature is shown by the high validity and reliability of the measurement results of a test.

a. Validity test

Validity testing is a test carried out to determine the validity of a questionnaire in collecting data, the questionnaire can be said to be true, if R count is greater than R table then each question is said to be valid.

Table 3. Validity Test Results of Performance Variables (X)

Variable	R Value. Count	R Value Table	Conclusion
X1	0.621	0.195	Valid
X2	0.734	0.195	Valid
X3	0.762	0.195	Valid
X4	0.589	0.195	Valid
X5	0.679	0.195	Valid
X6	0.728	0.195	Valid
X7	0.736	0.195	Valid
X8	0.732	0.195	Valid
X9	0.759	0.195	Valid
X10	0.709	0.195	Valid
X11	0.633	0.195	Valid
X12	0.615	0.195	Valid
X13	0.677	0.195	Valid
X14	0.713	0.195	Valid
X15	0.712	0.195	Valid

Table 4. Validity Test Results Satisfaction Variable (Y)

Variable	R Value. Count	R Value Table	Conclusion
Y1	0.580	0.195	Valid
Y2	0.593	0.195	Valid
Y3	0.613	0.195	Valid
Y4	0.487	0.195	Valid
Y5	0.654	0.195	Valid
Y6	0.661	0.195	Valid
Y7	0.700	0.195	Valid
Y8	0.629	0.195	Valid
Y9	0.727	0.195	Valid
Y10	0.671	0.195	Valid
Y11	0.638	0.195	Valid
Y12	0.579	0.195	Valid
Y13	0.632	0.195	Valid
Y14	0.614	0.195	Valid
Y15	0.655	0.195	Valid

b. Reliability Test

Reliability testing was carried out to determine whether the questionnaire that had been used in this study showed a level of precision and accuracy. Reliability testing is done by testing the instrument only once. Then analyzed using Cronbach's Alpha method. If the value of Cronbach's Alpha > 0.60 then it is reliable or consistent.

Table 5. Performance Reliability Test Results (X) and Satisfaction (Y)

Variable	Cronch's Alpha	R	Information
Performance	0.921	0.6	Valid
Satisfaction	0.889	0.6	Valid

c. Characteristics of Respondents

Characteristics of respondents obtained from the results of the distribution of questionnaires at survey locations to 100 respondents can be seen in the following table.

Table 6. Characteristics of Respondents

No	Characteristics	Category	Frequency	Percentage (%)
1	Gender	Man	48	48%
		Woman	52	52%
2	Age	17 – 22	14	14%
		23 – 34	38	38%
		35 – 44	35	35%
		>45	13	13%
3	Work	Student	4	4%
		Government employees	15	15%
		Private employees	73	73%
		Trader	3	3%
		Laborer	4	4%
		Does not work	1	1%

4.3. Performance Level and Satisfaction Level (Importance Performance Analysis)

Table 7. Calculation of Performance Level and Satisfaction Level

NO	STATEMENT	Performance	Satisfaction	X	Y
A.	RELIABILITY				
1	What do you think about the punctuality of arrival and departure of JR Connexion Bus	430	417	4.30	4.30
2	What do you think about the reliability of the JR Connexion Bus in delivering services from start to finish	434	430	4.34	4.17
B.	RESPONSE				
3	How do you rate the willingness and speed of service of the JR Connexion Bus officers in providing services?	417	400	4.17	4.00
4	How do you rate the ease of getting information about the JR Connexion Bus	386	383	3.86	3.83
C.	GUARANTEE				
5	How do you rate the certainty of getting a JR Connexion Bus ticket	406	410	4.06	4.10
6	How do you rate the safety at the bus stop and on the JR Connexion Bus	423	416	4.23	4.16
7	How would you rate the certainty of getting a seat on the JR Connexion Bus	403	399	4.03	3.99
D.	EMPATHY				
8	How would you rate the bus staff's understanding of the needs and feelings of the JR Connexion Bus passengers	406	393	4.06	3.93
9	How do you rate the JR Connexion Bus timing service	422	423	4.22	423
E.	INFORMATION				
10	How do you rate the cleanliness at the JR Connexion Bus Stop	416	415	4.16	4.15
11	How do you rate the cleanliness of the JR	427	427	4.27	4.27

Connexion Bus fleet

12	How do you rate the existence of a clear information board at the bus stop or passenger waiting room	386	380	3.86	3.80
13	How do you rate the physical condition and facilities on the JR Connexion Bus (Seats, Air Conditioning, etc.)	431	433	4.31	4.33
14	How do you rate the condition and suitability of the JR Connexion Bus safety equipment	420	424	4.20	4.24
15	How do you evaluate the condition of HR, the neat appearance of the JR Connexion Bus crew	444	447	4.44	4.47
	Average			4.16	4.13

Based on the results of the analysis of the table on service performance and the level of satisfaction of the JR Connexion Bus, a graph is obtained that shows the service performance and satisfaction level. This graph is based on the average value and corresponds to the serial number on the questionnaire.
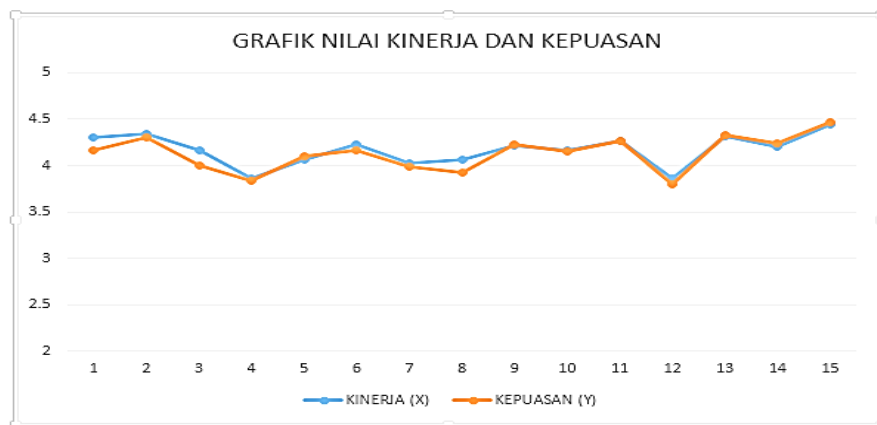

Figure 3. Graph of JR Connexion Bus Performance and Satisfaction Assessment

Based on the calculation of the average of each service dimension as a whole get the following results:

1. The average service quality for the performance of the JR Connexion bus route Kota Wisata Cibubur – Blok M reached an average value of 4.16, so it can be said that the performance for each dimension of service has reached the "Good" category.
2. The average quality of service for the satisfaction of passengers on the JR Connexion bus route Kota Wisata Cibubur - Blok M reached an average value of 4.13, so it can be said that the level of satisfaction for services for each dimension has reached the "Satisfied" category.

After knowing the average calculation of the performance appraisal and passenger satisfaction, then we can then see the description of the position of the service quality factors studied in the Cartesian diagram "Importance-Performance Analysis".
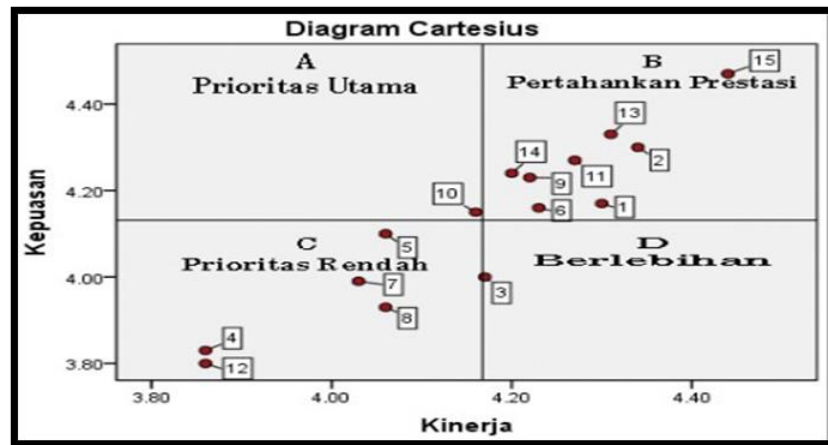
Figure 4. Cartesius Charts

Based on the results of the questionnaire data analysis depicted by the Cartesian diagram "Importance Performance Analysis", we can describe the results of the study as follows:

1. Quadrant A Top Priority (Prioritas Utama)
   Attribute 10 is: Cleanliness at the JR Connexion Bus Stop
2. Quadrant B Maintain Achievement (Pertahankan Prestasi)
   Attribute 1 is: The arrival time of the JR Connexion Bus
   Attribute 2 is: JR Connexion Bus reliability in delivering services
   Attribute 6 is: Security at the stop and on the JR Connexion Bus
   Attribute 9 is: JR Connexion Bus timing service
   Attribute 11 is: Cleanliness of the JR Connexion Bus Fleet
   Attribute 13 is: Physical condition and facilities on the JR Connexion Bus
   Attribute 14 is: The condition and feasibility of the JR Connexion Bus safety equipment
   Attribute 15 is: Human Resources Condition, Neatness of the JR Connexion Bus Crew
3. Quadrant C Low priority (prioritas Rendah)
   Attribute 4 is: Easy to get information about JR Connexion Bus
   Attribute 5 is: Certainty in getting the JR Connexion Bus ticket
   Attribute 7 is: Guaranteed to get a seat on the JR Connexion Bus
   Attribute 8 is: Bus staff understanding of passenger needs and feelings
   Attribute 12 is: The existence of an information board that is explained at the bus stop/waiting room
4. Quadrant D Excessive (berlebihan)
   Attribute 3 is: Availability and speed of service of JR Connexion Bus officers

5. Conclusion

Based on the results of research that has been carried out, it shows that the operational performance of the JR Connexion bus route Cibubur City - Blok M according to the Directorate General of Land Transportation is in the "Good" category with an overall score of 19 points. Regarding the level of service obtained from users of the JR Connexion bus route Cibubur - Blok M, stating that the quality of service for the performance of the JR Connexion Bus on the Cibubur tourist city - Blok M route, it can be said that the performance for each dimension of service has reached "good" category. Meanwhile, for the satisfaction level of the JR Connexion bus route, Kota Wisata Cibubur - Blok M, it got a value of 4.13, so it can be said that the service for each dimension has reached the "satisfied" category.

Based on the results of the Cartesian diagram obtained from the Importance Performance Analysis, there are several factors that must be improved on several service factors that are still below the expectations of the JR Connexion bus service users to match the desired expectations on the service factor located in quadrant C, namely Ease of getting information about buses JR Connexion, certainty in getting a JR Connexion Bus ticket, certainty in getting a JR Connexion Bus seat, understanding the bus staff about the needs and feelings of passengers, the existence of an information board that is explained at the bus stop/waiting room and Quadrant D, namely the readiness and speed of service of the JR Connexion Bus officers.

References

AM Arifin, DG (2015). Analysis Of Passenger Satisfaction Level In The Transjakarta Bus Service Facility Based On Minimal Service Standards (SPM). Journal of Social Humanities ISSN 2087-4928 Volume 6 Number 2.

Aris Savitri, TM (2017). Study Of Customer Satisfaction Level On Performance Of Transpakuan Bogor (Case Study: Service at the Bus Stop and Service on the Transpakuan Bogor Bus). Volume 6 Number 2, December 2017.

Dindayanti, BN (2020). Quality Of Public Transportation Services Trans Sarbagita Corridor I (Kota-GWK) IN 2018. Indonesian Scientific Journal p–ISSN: 2541-0849 Vol. 5, No. 1

Euis Saribanon, RS (2016). Transportation Service User Satisfaction. Vol. 03 No. 03

Hafran, SM (2019). BMA Public Transport Performance Analysis. Vol. 4, No.2, September (2019).

Hidayat, M. (2018). Factors Affecting Company Performance. Volume 02/No.5/September-2018 : 24-29.

Ministry, P. (2012). (SK.22.AK.005/UAKB/2012 concerning Minimum Service Standards for Bus Transportation Service Users).

Mardikawati, W. (2018). The Effect Of Customer Value And Service Quality On Customer Loyalty, Through Customer Satisfaction On Customers Bus Efficiency (Po Efficiency Study Department Of Yogyakarta - Cilacap). Journal Of Business Administration, Volume 2, Number 1.

Morlok, EK (1991). Introduction to Transport Engineering and Planning. Bandung: Erlangga.

Nugroho, P. (2016). Analysis Of User Satisfaction Mode Of Mass Transportation Bus Trans Semarang.

Government Regulation No. 41 of 1993. Road Transportation.

Prima, GR (2020). Level of Service User Satisfaction with Urban Public Transport Services in Tasikmalaya City. Journal of Civil Engineering p-ISSN2443-1729e-ISSN2549-3973Vol 6, No.2, October 2020.

Sukirman, S. (1994). The Basics of Road Geometric Planning.

Supranto, J. (2011). Measurement of Customer Satisfaction Level To Increase Market Share. Jakarta: PT Rineka Cipta.

Warpani, S. (1990). Planning the Transportation System. Bandung: Erlangga.

Winaya, A. (2018). Analysis of Operational Performance and OD Service Quality. Pure Beautiful Pearls and PO. Widji Lestari on the Surabaya-Tuban route. Journal of Civil Engineering, Madura University Vol. 4 No.2 December 2018 ISSN 2527-5542.

Biographies

Widodo Budi Dermawan, born on 2 July 1970. Completed his undergraduate education at the Parahyangan Catholic University, Bandung in 1994 with the title "Refueling System at Soekarno Hatta International Airport". Subsequently, he completed his master's degree at the University of Wisconsin at Madison, USA in 1996 with the title of his thesis "A Path-based Multi-class Dynamic Traffic Assignment Model". He is a Civil Engineering Lecturer at Mercu Buana University teaching courses in Transportation Engineering, Road Geometric Design, and Transportation Infrastructure. Fields of research carried out include the development of accident prediction models, road safety engineering and Intelligent Transportation System (ITS).

Muhammad Sylmi Taufanudin, born in jakarta 20 December 1998. He graduated from high school 1 Cileungsi, majoring in Social Sciences (Social Sciences) in 2017. Completed Bachelor of Civil Engineering at Mercu Buana University and will graduate in 2021 with the final project title "Analysis of the Level of Consumer Satisfaction with the JR Connexion Bus Transportation Service on the Cibubur - Blok m route". Has done practical work on the zone 4 Cimanggis - Cibitung toll road project section 2 in 2020 and was a vice of the civil engineering leadership training committee in 2018.

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