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Analysis of the Level of Public Satisfaction with the Performance of Services and Facilities at Tambun Station after Revitalization

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Abstract
In the contemporary era of globalization, the scope and nature of people's daily activities have undergone significant transformation. This is driven by an increase in economic activity and technological advancement. The optimal performance of a railroad station will have a direct impact on the level of service provided to users of railroad services. Tambun Railway Station is a Class III or small station situated in Mekarsari, South Tambun. The objective of this study is to analyze the level of user satisfaction with the facilities and services provided at Tambun Station. The regulatory framework utilized in this study is that set forth in PM 63 of 2019, which establishes minimum service standards for the transportation of people by train. The research employs two analytical techniques: importance-performance analysis (IPA) and customer satisfaction index (CSI). The results of the analysis demonstrate that the facilities and services at Tambun Station have met the standards set forth in PM No. 63 of 2019 concerning Minimum Service Standards. Furthermore, the level of user satisfaction with the performance of facilities and services is high, with a value of 84%. The respondents' satisfaction rate of 74.79% indicates a high level of satisfaction with the services provided by Tambun Station.

Keywords: tambun station, public satisfaction, user satisfaction, importance performance analysis (IPA), customer satisfaction index (CSI)

Introduction

In the current era of globalization, people's daily activities have changed. This is influenced by an increase in the economy and technological progress. People are not only focused on the need for consumption of physical products, but also people's needs. One of the service sectors that is vital to society is the transportation service sector (Isradi *et al*., 2024) [11]. This is because transportation, especially public transportation, is one of the basic needs of society, especially for urban communities (Isradi *et al*., 2022) [9].

Minimum Service Standards (MSS) are service measures that must be met by service providers in providing services to service users, with benchmarks that are used as guidelines for service delivery, and service quality assessment references as a commitment of service providers to the community in the context of quality, fast, easy, affordable and measurable services (Siddique & Basak, 2018) [18]. Optimal station performance will have an impact on the level of service provided to rail service users. The growth of rail service users at Tambun Station has been increasing from year to year. With the increasing number of service users, the station must be able to meet the needs of rail service users (Chen *et al*., 2022; Rachmadina *et al*., 2023) [3, 17]. Previously, Tambun Station experienced the suspension of KRL operations. This is because there are several complaints from users about the services at the station, which make users feel less adequate and comfortable (Isradi, Molina, *et al*., 2021; Isradi, Stini, *et al*., 2021) [10, 12]. Another problem is the capacity of the parking lot, which is still insufficient, especially during major holidays.

With the revitalization, the facilities available at Tambun Station can be used comfortably and safely in accordance with the minimum service standards, and the level of crowding among station users can be reduced (Esmailpour *et al*., 2020) [5]. Therefore, when the revitalization was carried out, many people took the KRL from Bekasi Station (Firdaus *et al*., 2022) [7]. Therefore, this study was conducted to analyze the level of public satisfaction with the facilities and services of Tambun Station after revitalization (Kinasih & Permata, 2022) [14]. The purpose of this study is to determine the value of Customer Satisfaction Index (CSI) by calculating the performance value and the level of importance of service users to services at Madiun Station with the Importance Performance Analysis (IPA) method using quadrant analysis / Cartesian diagrams.(Leliana & Widyastuti, 2018) [15]. In addition, the author wants to evaluate the facilities and services of Tambun Station so that it is expected to make recommendations to the station manager so that as the community increases, station managers and KAI can make improvements and improve services so that the safety and comfort available are in accordance with the provisions of applicable regulations (Firdaus *et al*., 2021) [6].

Research Method

The research site was Tambun Station located in Mekarsari, South Tambun. The author conducted an observation survey for 2 days, namely 1 day on weekdays and 1 day on weekends, and distributed questionnaires to 100 users of Tambun Station.

Fig 1: Research location

The research design for the type of data and analysis is quantitative descriptive data analysis. The data used in the research are primary data obtained through direct surveys and questionnaires in the form of gforms distributed to station users and secondary data obtained from related agencies such as station plans and the average number of Tambun Station users (Girma *et al*., 2022) [8].

The respondents who completed the questionnaire are users of the KRL Commuter Line who exit/enter at Tambun Station. The average number of passengers at Tambun Station is 11,039 people per day on weekdays and 9,153 people per day on weekends. (Joy Andre, 2023) [13]. The number of samples required is calculated using the formula of the Slovin method as follows:

$$n = \frac{N}{1+Ne^2}$$

$$n = \frac{20.192}{1+(20.192*0,1^2)} = 99,507 \approx 100\ Responden$$

The data from the questionnaire results were tested using SPSS software to calculate validity and reliability values, and then analyzed using the Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI) methods (Andriyani *et al*., 2021; Dwiatmoko *et al*., 2022) [2, 4].

Result and Discussion

Respondent Characteristic Data

The respondents in this study were 100 users of the Commuter Line Railway (KRL) from Tambun Station who would travel to Jakarta or Cikarang. The characteristics of respondents can be grouped according to the needs of presenting data for a study. In this case, the characteristics of respondents known in the questionnaire are: gender, age, occupation, frequency of using Tambun Station intensity in one week, access to the station, cost of expenditure in one week, and destination. Based on the distribution of the questionnaire, the distribution of the characteristics of the respondents can be seen from Table 1 below:

Table 1: Respondent Characteristics

Variables			Percentage (%)
1	Gender	Male	28%
		Female	72%
2	Age	<16 years old	1%
		16-25 years old	88%
		26-35 years old	5%
		36-45 years old	2%
		>45 years	4%
3	Jobs	Student	74%

		Public Servant	5%
		Private Employee	12%
		Self-employed	5%
		Others	4%
4	Frequency of using the KRL at Tambun Station/per week	1 time	0%
		2-3 times	61%
		3-4 times	20%
		4-5 times	7%
		>5 times	12%
5	Access to Tambun Station	Public Transportation	14%
		Online Transportation	27%
		Private Vehicle	59%
6	Nominal cost of using KRL in/per week	< IDR 10.000	23%
		IDR 10.000 – IDR 15.000	32%
		IDR 15.000 – IDR 20.000	26%
		> IDR 25.000	19%
7	Destination	School/College	43%
		Work	15%
		Travel	36%

Based on Table 1 above, data on the characteristics of respondents can be obtained, which states that the majority of station users are women, then for the age of users there is a range of 16-25 years old and most of the users are students or students who use KRL. As many as 59% of people use private transportation to go to the station. As many as 32% of the users spend around Rp 10,000 - Rp 15,000 in the cost of use. The most common destinations of station users are for school/college activities.

Validity Test

The purpose of this validity test is to measure whether or not a questionnaire is valid in research. The validity is determined by comparing the calculated r value with the r table value. The following is the calculation of the power validity test (Nugraha, 2020) [16], which can be seen in Table 2 below:

Table 2: Calculating Validity Test Performance Variables

No	X	Y	XY	X^2	Y^2
1	5	124	620	25	15376
2	4	105	420	16	11025
3	4	104	416	16	10816
4	4	94	376	16	8836
5	4	104	416	16	10816
6	4	109	436	16	11881
…	…	…	…	…	…
100	5	102	510	25	10404
Result	392	10093	40184	1580	1039163

Based on Table 2 above, the values of Y, XY, X2 and Y2 can be obtained and entered into the following formula for calculating the validity of the performance test.

$$r = \frac{n(\sum XY) - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y)^2]}}$$

$$r = \frac{100(40184) - (392)(10093)}{\sqrt{[100(1580) - (392^2)][100(1039163) - 10093^2]}}$$

$$r = \frac{(4018400) - (3956456)}{\sqrt{[4336][2047651]}} = 0{,}657$$

The following is the calculation of the Validity Test of Interests, which can be seen in Table 3 below:

Table 3: Calculation of Variable Importance Validity Test

No	X	Y	XY	X^2	Y^2
1	4	99	396	16	9801
2	3	113	339	9	12769
3	5	96	480	25	9216
4	3	119	357	9	14161
5	5	105	525	25	11025
6	5	86	430	25	7396
…	…	…	…	…	…
100	5	120	600	25	14400
Result	454	11437	52611	2126	1334835

Based on Table 3 above, the values of Y, XY, X2, and Y2 can be obtained, which will be entered into the calculation formula for the validity test of the following interests.

$$r = \frac{n(\sum XY) - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y)^2]}}$$

$$r = \frac{100(52611) - (454)(11437)}{\sqrt{[100(2126) - (454^2)][100(1334835) - 11437^2]}}$$

$$r = \frac{(5261100) - (5192398)}{\sqrt{[6484][2678531]}} = 0{,}521$$

So that if:

r count > r table = valid

r count < r table = invalid

The criteria for the value of r table uses a significance level of 5% with a value of 0.195 for a sample size of 100 samples. The following results of the validity test analysis are shown in Table 4 below:

Table 4: Average Calculation Results of Questionnaire

No	R Table	Service Performance Level (X)		Facility Importance Level (Y)	
		R Count	Results	R Count	Results
P1	0,195	0,657	VALID	0,521	VALID
P2	0,195	0,619	VALID	0,412	VALID
P3	0,195	0,588	VALID	0,575	VALID
P4	0,195	0,596	VALID	0,615	VALID
P5	0,195	0,539	VALID	0,637	VALID
P6	0,195	0,593	V ALID	0,644	VALID
P7	0,195	0,613	VALID	0,649	VALID
P8	0,195	0,717	VALID	0,707	VALID
P9	0,195	0,531	VALID	0,664	VALID
P10	0,195	0,661	VALID	0,681	VALID
P11	0,195	0,593	VALID	0,722	VALID
P12	0,195	0,746	VALID	0,701	VALID
P13	0,195	0,617	VALID	0,689	VALID
P14	0,195	0,661	VALID	0,691	VALID
P15	0,195	0,619	VALID	0,684	VALID
P16	0,195	0,721	VALID	0,606	VALID
P17	0,195	0,749	VALID	0,599	VALID
P18	0,195	0,677	VALID	0,673	VALID
P19	0,195	0,788	VALID	0,714	VALID
P20	0,195	0,568	VALID	0,736	VALID
P21	0,195	0,709	VALID	0,74	VALID
P22	0,195	0,675	VALID	0,684	VALID
P23	0,195	0,722	VALID	0,732	VALID
P24	0,195	0,672	VALID	0,705	VALID
P25	0,195	0,638	VALID	0,685	VALID
P26	0,195	0,709	VALID	0,612	VALID
P27	0,195	0,667	VALID	0,703	VALID

Based on Table 4 above, it can be seen that the R-count data for both performance and importance is greater than the R-table, so it can be said that the data is valid.

Reliability Test

Reliability testing is a tool for measuring a questionnaire where each attribute or question is said to be reliable or consistent. Reliability testing uses Cronbach's Alpha formula. According to Ghozali (Ahmad & Kurniawan, 2023) [1], it shows that Cronbach's Alpha is acceptable if> 0.6. The closer the Cronbach's Alpha is to 1, the higher the internal consistent reliability.

The following is the calculation of the performance reliability test

a. Finding the value of the statement variant

$$\sigma = \frac{n\sum Xt^2-(\sum Xt)^2}{n(n-1)}$$

$$\sigma = \frac{100*1580-(392)^2}{100*(100-1)} = 0{,}438$$

b. Calculating the number of variants

$\sum\sigma b^2$ = 0,438 + 0,617 + 0,688 + … = 17,965

c. Calculating the coefficient of instrument reliability

$$a=\left[\frac{k}{k-1}\right]\left[1-\frac{\sum\sigma_b^2}{\sigma_t^2}\right]$$

$$a=\left[\frac{27}{27-1}\right]\left[1-\frac{17{,}965}{206{,}833}\right] = 0{,}948$$

The following is the calculation of the interest reliability test

a. Finding the value of the statement variant

$$\sigma = \frac{n\sum Xt^2-(\sum Xt)^2}{n(n-1)}$$

$$\sigma = \frac{100*2123-(454)^2}{100*(100-1)} = 0{,}655$$

b. Calculating the number of variants

$\sum\sigma b^2$ = 0,655 + 0,836 + 0,814 + … = 23,095

c. Calculating the coefficient of instrument reliability

$$a=\left[\frac{k}{k-1}\right]\left[1-\frac{\sum\sigma_b^2}{\sigma_t^2}\right]$$

$$a=\left[\frac{27}{27-1}\right]\left[1-\frac{17{,}965}{206{,}833}\right] = 0{,}948$$

Thus, the determination of reliability can be said to be reliable if

Alpha > r table = reliable
Alpha < r table = not reliable

The following are the results of the performance reliability test and interests can be seen in Table 5 as follows:

Table 5: Reliability Test Results Performance (X) and Interests (Y)

No	Variable	Cronbach's alpha	Condition r table	Items	Result
1	Performance (x)	0,948	0,6	27 questions	Reliabel
2	Importance (y)	0,950	0,6	27 questions	Reliabel

Based on Table 5 above, it can be seen that the value of the performance reliability test results is 0.948 and the interest is 0.950, which is greater than the value of the r table requirement of 0.6 with 27 question items. Therefore, the data results can be declared reliable.

IPA Method Test (Importance Performance Analysis)
In this study, the effect of service facilities on the number of passengers on commuter trains in Jabodetabek was investigated. Assessment of the performance of service facilities and the importance of service facilities from respondents is taken the average score and later a mapping will be drawn in a cartesian diagram.

Performance Level Score (X) and Interest Level Calculation
This calculation is used to determine the Performance Level Assessment score and Interest Level of the submitted question indicators by summing the scores of each indicator.

Averaging Performance and Interests
This calculation is used to determine the average value of the indicator values that have been answered by respondents and summed.

Average performance level (X) = $\frac{Xi}{n} = \frac{392}{100} = 3{,}92$

Average level of importance (Y) = $\frac{Yi}{n} = \frac{454}{100} = 4{,}45$

Conformity Level Value Calculation
This calculation is used to determine the average value of performance and importance, which will be categorized in a Cartesian chart.

$$TKi = \frac{3{,}92}{4{,}54} x100 = 86\%$$

The results of the calculation of the average performance and importance of the IPA method are shown in Table 6 below:

Table 6: Calculation Results of Average Performance and Importance Assessment with Importance Performance Analysis (IPA) Method

No	Indicator	Performance Assessment	Importance Assessment	X	Y	GAP	Conformity Value (%)
1	P1	392	454	3,92	4,54	-0,62	86%
2	P2	364	425	3,64	4,25	-0,61	86%
3	P3	383	429	3,83	4,29	-0,46	89%
4	P4	379	412	3,79	4,12	-0,33	92%
5	P5	398	429	3,98	4,29	-0,31	93%
6	P6	380	438	3,8	4,38	-0,58	87%
7	P7	410	433	4,1	4,33	-0,23	95%
8	P8	377	430	3,77	4,3	-0,53	88%
9	P9	409	405	4,09	4,05	0,04	101%
10	P10	394	432	3,94	4,32	-0,38	91%
11	P11	391	432	3,91	4,32	-0,41	91%
12	P12	353	434	3,53	4,34	-0,81	81%
13	P13	355	439	3,55	4,39	-0,84	81%
14	P14	359	430	3,59	4,3	-0,71	83%
15	P15	370	424	3,7	4,24	-0,54	87%
16	P16	357	416	3,57	4,16	-0,59	86%
17	P17	358	393	3,58	3,93	-0,35	91%
18	P18	387	422	3,87	4,22	-0,35	92%
19	P19	366	436	3,66	4,36	-0,7	84%
20	P20	393	416	3,93	4,16	-0,23	94%
21	P21	339	416	3,39	4,16	-0,77	81%
22	P22	350	411	3,5	4,11	-0,61	85%
23	P23	387	411	3,87	4,11	-0,24	94%
24	P24	360	428	3,6	4,28	-0,68	84%
25	P25	365	421	3,65	4,21	-0,56	87%
26	P26	353	402	3,53	4,02	-0,49	88%
27	P27	364	419	3,64	4,19	-0,55	87%
Average value							88%

Based on Table 6 above, the results of the average calculation of performance and importance with the IPA method can be obtained with a greater comparative value of the importance calculation than the performance value. Therefore, there is a GAP value in the form of a negative value. However, the results of the GAP value show a comparison value that is not too large, so the average value of suitability can be drawn at 88%, which is classified as a "good" value.
To find the value on the Cartesian chart, it is necessary to find the value of the intersection of the two lines through the

average score point (X, Y).

$$Xi = \frac{\sum Xi}{n} = \frac{392}{100} = 3{,}92$$

$$Yi = \frac{\sum yi}{n} = \frac{454}{100} = 4{,}54$$

The following is a Cartesian diagram, as shown in Figure 2 below

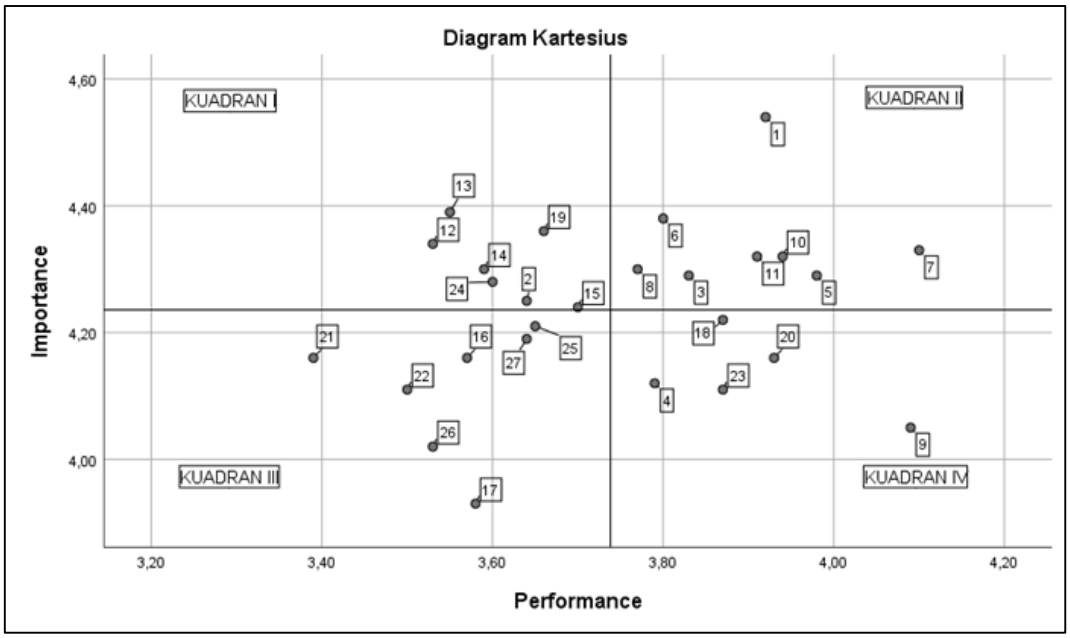

Fig 2: Cartesian diagram

Based on Figure 2 above, it can be seen that there are 7 indicators in quadrant 1, which means that it is the top priority for immediate improvement of these facilities. Then there are 8 indicators in quadrant II, which means that the facility satisfies the users so that its performance is maintained. In Quadrant III there are 7 indicators where this facility has a low priority due to low levels of importance and performance. In quadrant IV there are 5 indicators where this facility is not too less important, but the performance is carried out normally as usual.

CSI Method Test (Customer Satisfaction Index)

Analysis of the Customer Satisfaction Index (CSI) method is to determine the level of respondent satisfaction with the level of performance and level of importance.

Calculation of *Mean Importance Score* (MIS) and *Mean Satisfaction Score* (MSS)

The *Mean Importance Score (MIS*) is the average of the importance level scores and the *Mean Satisfaction Score (MSS)* is the average of the performance level scores based on respondents.

$$MIS = \left[\frac{\sum_{i=1}^{n} xi}{n}\right] = \frac{392}{100} = 3{,}92$$

$$MSS = \left[\frac{\sum_{i=1}^{n} Yi}{n}\right] = \frac{454}{100} = 4{,}54$$

Calculation of *Weight Factor* (WF) value or weighted factor

Results Presentation of MIS value per indicator to total MIS of all indicators

$$\text{WF} = \frac{MISi}{\sum_{i=1}^{p} MISi} = \frac{4{,}54}{114{,}37} = 0{,}0396 \approx 3{,}97$$

Calculation of *Weight Score* (WS) value or weighted score

The result of multiplying WF by *Average Satisfaction x Mean Satisfaction Score* (MSS)

WSi = WFi x MSS = 3,96 x 3,92 = 15,56

Calculation of *Customer Satisfaction Index* (CSI) Value

$$\text{CSI} = \left[\frac{\sum_{i=1}^{p} MISi}{HS}\right] \text{ x } 100\% = \frac{373{,}93}{5} x\ 100 = 74{,}79\%$$

The results of calculating the *Mean Importance Score* (MIS) and *Mean Satisfaction Score* (MSS), *Weight Factor* (WF), *Weight Score* (WS), and *Customer Satisfaction Index* (CSI) are shown in Table 7 below:

Table 7: Calculation results of MSS, MIS, WF and WS values

InIndicator	MSS (Average Performance)	MIS (Average Performance)	WF	WS
P1	3,92	4,54	3,97	15,56
P2	3,64	4,25	3,72	13,53
P3	3,83	4,29	3,75	14,37
P4	3,79	4,12	3,60	13,65
P5	3,98	4,29	3,75	14,93
P6	3,8	4,38	3,83	14,55

P7	4,1	4,33	3,79	15,52
P8	3,77	4,3	3,76	14,17
P9	4,09	4,05	3,54	14,48
P10	3,94	4,32	3,78	14,88
P11	3,91	4,32	3,78	14,77
P12	3,53	4,34	3,79	13,40
P13	3,55	4,39	3,84	13,63
P14	3,59	4,3	3,76	13,50
P15	3,7	4,24	3,71	13,72
P16	3,57	4,16	3,64	12,99
P17	3,58	3,93	3,44	12,30
P18	3,87	4,22	3,69	14,28
P19	3,66	4,36	3,81	13,95
P20	3,93	4,16	3,64	14,29
P21	3,39	4,16	3,64	12,33
P22	3,5	4,11	3,59	12,58
P23	3,87	4,11	3,59	13,91
P24	3,6	4,28	3,74	13,47
P25	3,65	4,21	3,68	13,44
P26	3,53	4,02	3,51	12,41
P27	3,64	4,19	3,66	13,34
Total	100,93	114,37		
WS Total			373,93	
CSI			74,79%	

Based on Table 7 above, the total value of performance MSS and importance MIS can be obtained, then the two total results are entered into the WF and WS calculation formulas. From these calculations, we can see that the CSI value is 74.79%. This indicates that satisfaction is included in the "good" criteria.

Conclusions

Based on the results of the research fund analysis, the following conclusions were drawn:

a. In general, the facilities and services at Tambun Station are in compliance with PMI Standard No. 63 of 2019 on minimum service standards.
b. From the analysis of the importance performance analysis method, it can be seen that there are 8 indicators included in quadrant II, where this attribute must maintain its performance, and there are 7 indicators included in quadrant I, which are the top priorities that require improvement. Thus, the level of performance and the level of importance of the facilities and services at Tambun Station get a good value, which is 88% based on the results of the Importance Performance Analysis analysis.
c. Based on the results of calculating the Customer Satisfaction Index analysis, the respondents' satisfaction level of 74.79% shows the "Good" criteria.

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