Analysis of Minimum Service Standards and Passenger Satisfaction for the Electric Train (KRL) on the Cikarang–Sudirman Commuter Line

Rhystya Atysya Maruddhany, Eddy Triyanto Sudjatmiko*, Prihartono

Department of Civil Engineering, President University, Cikarang, Indonesia

Received 20 August 2024; received in revised form 25 August 2024; accepted 26 August 2024

Abstract

KRL is a public transportation system is in the great interest of the Indonesian because it is considered effective and efficient for the community and can be a solution to streamline the mobility of the population, especially for the populace in the Jabodetabek region. As the number of passengers increases every year, it is important to know the services and facilities provided by the operator. This research aims to determine the quality of services and facilities of this transportation mode, both at the station and during the trip. The study examines the KRL Commuter Line service between Cikarang and Sudirman, with Sudirman Station selected as a representative sample for analysis. The analysis is made in accordance with Regulation of the Minister of Transportation No. 63 of 2019, and the level of customer satisfaction is analyzed using the Important Performance Analysis/IPA method and Customer Satisfaction Index/CSI. The research indicates that the services at Sudirman Station comply with most of the minimum standards outlined in the regulation, however some facilities need to be provided such as full platform roof, customer work desk and elevator or lift for disable. While on the train, CCTV and first aid kit need to be installed. According to the IPA method, there are attributes of service that need to be enhanced on the primary priority scale: (1) the height/width difference of the station platform floor and the railroad floor; (2) seating facilities in the waiting room; (3) passenger service facilities such as work desks; (4) a special elevator (lift) for passengers using wheelchairs; (5) availability of a first aid kit in each train set; (6) space capacity to carry standing maximum of 1 m^2 for 6 people; (7) availability of CCTV in the train; and (8) punctuality of departure or arrival time. In addition, the CSI score for KRL Sudirman station's quality of service performance is 71.60%, indicating that customers are satisfied with the quality of service provided.

Keywords: KRL, commuter, minimum service standards, customer satisfaction index, important performance analysis

1. Introduction

Transportation is one of the most important elements in the development of a country. One of the foundations of the country's economic development, community development, and industrialization growth. The positive impact of transportation development is that it can encourage economic activity and development in a region and country [1]. The impact of the movement of people and goods or the need for movement will cause the need to provide transportation facilities and infrastructure to create safe, comfortable, smooth, and economical movement in terms of time and cost. The need for traffic is not only a natural demand but also requires a good system to achieve the aforementioned goals [2].

* Corresponding author. E-mail address: eddy.triyanto@president.ac.id
Tel.: +62(0)21 89109763

The electric railway, known as KRL (Kereta Rel Listrik), is a public transportation system that is in great demand for Jabodetabek commuter. This public transportation provides effective and efficient transference way for the community, as it can be a solution to streamline the mobility of the population. Especially as this KRL offers many advantages, such as cheap tariffs, avoiding traffic jams, and a relatively short travel time to reach its destination. KRL is an electric train service operated by PT Kereta Commuter Indonesia, a subsidiary of PT Kereta Api, transporting passengers within urban areas or from cities to suburbs. According to the official website of PT KAI, KRL has been operating in the Jakarta area since 1925. Today, KRL serves commuter routes in the Jabodetabek area as well as the Yogyakarta-Solo route. KAI Commuter was officially established on September 15, 2008, as PT KAI Commuter Jabodetabek, replacing the Jabotabek City Transportation Office. The company is headquartered at Juanda Station. The Jabodetabek KRL Commuter Line operates 92 active stations within the Jabodetabek area. The KRL on the Cikarang-Sudirman route currently stops at 14 stations: Cikarang Station, Metland Telaga Murni Station, Cibitung Station, Tambun Station, Bekasi Timur Station, Bekasi Station, Kranji Station, Cakung Station, Klender Baru Station, Buaran Station, Klender Station, Jatinegara Station, Matraman Station, Manggarai Station, and finally, Sudirman Station.

Passenger traffic in the Jabodetabek area is substantial. According to PT KAI's official website, nearly 13 million passengers used the commuter line in November 2022, averaging 684,019 passengers per day [3]. In July 2024, PT KAI reporting that volume of commuter line passenger is about 1.5 million people/day [4]. This number is increasing every year. As the number growths, it also increases complaints about its comfort and safety [5]. For instance, there is a very long tap-out at the electronic gate to exit the Sudirman station. This is probably because of the unparalleled number of passengers go down at Sudirman Station. Another passenger complaint is that the number of passengers exceeding the capacity of the train in each of its carriages, causing discomfort and makes the passenger feel insecure. The facilities for supporting passengers with special needs and people with disabilities are not complete. Sometimes technical problems occur, so the schedules of departure and arrival are not on time, and they are still unable to provide timely service, complaints about the comfort and safety of passengers, and the difference in height and the gap between the platform and the train floor are troublesome for these KRL users, and passenger service facilities that are not functioning properly. As well as many other complaints that need to be address and evaluate by the electric train operator.

The commuter line electric rail train acts as one of the main public transportations in the Jabodetabek area, so factors in customer service must receive special attention. Maintaining user loyalty and improving service quality must be continuously carried out to provide maximum satisfaction to customers. PT. Kereta Api (Persero) as one of the state-owned companies which operates in the field of providing transportation services is required to improve its services to the community in order to produce maximum satisfaction for service users or customers. The concept of customer satisfaction is an assessment of the level of satisfaction of customer or service user after comparing the perceived performance or results with expectations and perceptions of the service. The purpose of this research is to determine consumer characteristics, the level of customer satisfaction in using the Sudirman – Cikarang electric rail train regarding the perceived service and company performance and determine the criteria that are service priorities. By using the Customer Satisfaction Index (CSI) method to determine the level of consumer satisfaction with the use of services provided by PT KRL commuter Jabodetabek.

To find out the quality level of service offered by this public transport mode, it is interesting to conduct research to find out the application of the minimum service standard as regulate by the government on its services. At its station as well as on board. The KRL commuter line study specifically the line connecting Cikarang – Sudirman, and Sudirman Station had been taken as a sample of station to be analyzed. Cikarang – Sudirman route is chosen as its one far-off route of the KRL services. And Sudirman Station is chosen it is considered as one of the busiest stations.

The study aims to assess the alignment between passenger expectations and the actual performance of the services

provided, in accordance with Transportation Ministerial Regulation No. 63 of 2019 [6], which outlines the minimum service standards for train transportation. Further to this, the level of customer satisfaction will also be examined through the dissemination of questionnaires. The results of the questionnaire obtained will be analyzed using the Important Performance Analysis (IPA) and Customer Satisfaction Index (CSI) methods.

2. Research Methodology

The research is conducted on the Cikarang – Bekasi – Sudirman – Tanah Abang commuter line. Sudirman Station had been taken as a sample of station to be analysed. The research is conducted in July 2023.

2.1 Standard of minimum Service

As a public transportation, the level of services has to comply to government regulation. Specific for this KRL is the Transportation Ministerial Regulation No.63 of 2019 concerning Standards of Minimum Service at Stations and on the Train [6]. There are 6 (six) aspects of standards of minimum service that has to be fulfilled by the operator of the train and its station. That is; (1) safety and health, (2) security, (3) reliability, (4) comfort, (5) convenience, and (6) equality. Each should be provided by kind of services, indicator and its benchmark. This research inspects the availability of each aspect above and compares it with the standards of minimum services from applicable regulations. Table 1 presents the minimum standard services at the station and Table 2 presents the minimum standard service on the train.

2.2 Customer satisfaction

Customer Satisfaction is a customer evaluation of whether a product or service can meet the needs and qualifications desired by the customer [7]. Hence, customer satisfaction can also be a powerful variable that affects purchasing decisions. Customer satisfaction is defined as the experience of pleasure or dissatisfaction that arises from comparing actual performance or product outcomes with individual customer expectations [8]. Passenger satisfaction is the result of the use of a product or service, equal to or above expectations. There are several factors that affect customer satisfaction such as: cost, price, emotion, quality of service and product quality. Customer satisfaction is the long-term driving force that connects the company to the customer [9].

There are several methods used to measure and monitor customer satisfaction. It is divided it into 4 (four) methods [10]: (1). Complaints and advice system: Every customer-oriented organization needs to provide an easy and convenient way and means for its customers to communicate advice, criticism, opinions and complaints. The media used can be suggestions boxes placed in strategic locations (comfortable or frequently passed by customers), comment cards (filled directly or delivered to the company), pulse-free special telephone channels, websites, etc. (2). Customer satisfaction: Satisfaction surveys are conducted to assess the level of service received and expected by the service users. Surveys can be done by letter, telephone, email, website, or face-to-face interview. Respondents to this survey were asked to answer some questions about the various aspects of the service provided by the service provider. (3). Ghost shopper: Ghost shopper is someone assigned to pretend to be a consumer. The quality of the service provided by the service provider will be evaluated by the ghost shopper. This technique can also be applied to the services of a competitor company to identify the strengths and weaknesses of the competitor's services. (4). Switching consumer analytics: To gather information and understand why service users switch to competing companies, customer-shifting analysis techniques can be used. This technique is done by contacting the consumer or user of the converted service. By understanding why consumers switch, companies can improve the services they provide to consumers.

Table 1 Minimum service standards at the station

Type of service	Indicator	Benchmark
1. Health and safety		
• Information safety and facilities • Information health and facilities • Platform canopy • Platform	• Availability • Amount • Condition	• Safety facilities such as fire extinguishers, evacuation gathering points, alarm buttons for emergency conditions and emergency call, • Health facilities such as first aid kit, stretcher, and wheelchair, • Platform canopy to protect passengers from heat and rain, • The height difference of the station platform floor is not more than 20 cm with the railroad floor.
2. Security		
• Information safety and facilities • Information health and facilities • Platform canopy • Platform	• Availability • Amount • Condition	• Security facilities such as CCTV • Security officers/personnel • Complaint phone number sticker if there is a security disturbance
3. Reliability		
• Ticket sales service • Operating schedule information and railway service network map	• Availability • Condition	• Manual top-up lockets and/or vending machines along with procedures for purchase and top-up, • Operation schedule board and KRL Service network map.
4. Comfort		
• Waiting room area • Toilet • Mosque • Air circulation • Lighting	• Availability • Amount • Condition	• Seating facilities in the waiting room is clean and maintained for 1 (one) person with a minimum of 0.6 m^2, • Toilet and mosque facilities in clean and maintained conditions, • Air circulation control facilities such as air conditioner or fans with a maximum temperature of 27°C in the waiting room, • Lighting facilities with appropriate light intensity.
5. Convenience		
• Information service • Train trip disruption information	• Availability • Amount • Condition	• Information on station plans, schedule, and train fares in the form of visuals (information screens) and audio, • Advanced transportation information such as location, type of transportation, and routes that are easy to see and read, and information about train trip disruptions • Passengers service facilities such as work desks, • Ample and safe vehicle parking space for 2-wheeled or 4-wheeled vehicles.
6. Equality		
Facilities for passengers with special needs.	• Availability • Amount • Condition	• A ramp a maximum slope of 10° and access roads connecting between platforms, • Disabled toilets, • Pedestrian path with building blocks for passengers with special needs, • A special elevator or lane for passengers using wheelchairs. • Lactation room (Nursing room)

Table 2 Minimum service standards on the train

Type of service	Indicator	Benchmark
1. Health and safety		
• Information safety and facilities • Information health and facilities • Train doors	• Availability • Amount • Condition	• Safety facilities such as fire extinguishers (at least 1 piece), emergency buttons for emergencies, automatic door opening levers, evacuation instructions, and emergency phone numbers are available. • First aid kit in each train set (at least 1 set), • Space capacity to carry standing passenger maximum 1m² for 6 people (no crowding), • The door works well.
2. Security		
• Support facilities, • Security officers • Security disturbance information • lighting lamp	• Availability • Amount • Condition	• CCTV in the train (at least 2 (two) CCTV in 1 (one) train), • Uniformed officers who are ready to assist passengers equipped with attributes and assistive devices, • Complaint phone number stickers in case of security disturbances, • Lighting works properly.
3. Reliability		
Accuracy of train schedules	• Condition	• Punctuality of departure or arrival time
4. Comfort		
• Standing passenger handrail facilities, • Air circulation control facilities, • Cleanliness	• Availability • Amount • Condition	• Hand grip (for standing passengers) and luggage rack above the seat, • Air conditioner/fan or air ventilation with a maximum temperature of 27°C, • Cleaners who always clean the train during the trip.
5. Convenience		
Information of station and disruptions	• Availability	• Information on stopping stations and disruptions during KRL travel (via visual or audio).
6. Equality		
Facilities for passengers with special needs.	• Availability	• Priority seats at every corner of the train for special needs passengers (pregnant women, elderly, people with disabilities, and passengers with toddlers).

2.3 Populations and sample

The sample should be as large as feasible [11], as a larger sample generally provides more representative results. However, the acceptable sample size varies by study type. For descriptive research, the minimum sample size should be 10% of the population. In correlational research, at least 30 subjects are required. Causal-comparative research necessitates a minimum of 30 subjects per group, while experimental research requires at least 15 subjects per group. The method used to determine the large sample data questionnaire in this study is a simple random sampling system. The Slovin's formula below (Eq. 1) is used to determine the number of samples required.

$$n = \frac{1}{1+n \cdot e^2} \quad \text{..... (1)}$$

where n is the number of samples required, N is the number of populations, and e is the sample margin of error (10%).

2.4 Validity and reliability test

The validity test is used to determine whether a research questionnaire is valid [12]. A questionnaire is valid if the questions in it reveal what the questionnaire seeks to measure. The validity test is performed by comparing the calculated value with the r-table value with the degree of freedom (df) = n-2, where n is the sample size. The criteria for validity testing are as follows: (1) If r-count value ≥ r-table then the instrument or question item has a significant correlation with the total score

(valid statement). And (2) If *r*-count value < *r*-table, the instrument or question item does not correlate significantly with the total score (declared invalid).

A reliability test is a tool for measuring research questionnaires that are indicators of a variable or structure. Reliability tests are also used to test the consistency of data held over a period of time, that is, to find out the extent to which the measurements used are reliable or trustworthy. Reliability measurement is done by One Shot, that is, only one measurement is made, then the results are compared with other questions or correlations between the answers to the measurement questions. The technique used in this study is Cronbach Alpha (α), a structure or variable that is considered reliable if it gives a Cronbach Alpha value of > 0.70, and to facilitate calculations in this reliability test, computer aids and SPSS (Statistical Package for Social Science) are used. The Cronbach Alpha Formula can also be used in reliability testing using the SPSS program (Eq. 2),

$$r_{11} = \left[\frac{k}{k-1}\right]\left[1\frac{\sum a_b^2}{a_t^2}\right] \quad \text{(2)}$$

where r_{11} is the reliability values, k is the number of questions, a_b^2 is the number of item variants, and a_t^2 is the total of variants.

2.5 Important Performance Analysis

This study will employ the Importance Performance Analysis (IPA) and Customer Satisfaction Index methods. The IPA method, introduced by [13], assesses the importance and performance expectations of service providers and measures how satisfied service users are with the services received. The IPA method emphasizes the level of suitability, specifically the comparison between service performance scores and service user interest / expectation scores. The letters X and Y will represent 2 (two) parameters that will be used in this study. X represents the performance level of the service and Y represents the level of expectation. In this method after scoring so its advanced stages are calculating the average score of performance and important level, then calculating of the level of alignment between performance and expectations, then calculating of average performance level score and expectation level, and the finally to create Cartesian diagram for analysis.

The average value of performance level and importance level is plotted on a Cartesian diagram with 4 (four) quadrants. Quadrant I show attributes that are considered important by users, but service provider performance is still so low that user expectations are not met. Quadrant II, showing attributes considered important by users and service providers performing well enough to meet user expectations. Quadrant III, showing attributes that are considered less important by users, also have lower performance for service providers. Quadrant IV, showing attributes that are considered less important by users, but the performance of service providers is high or satisfactory, shape of the diagram showed in Fig. 1.

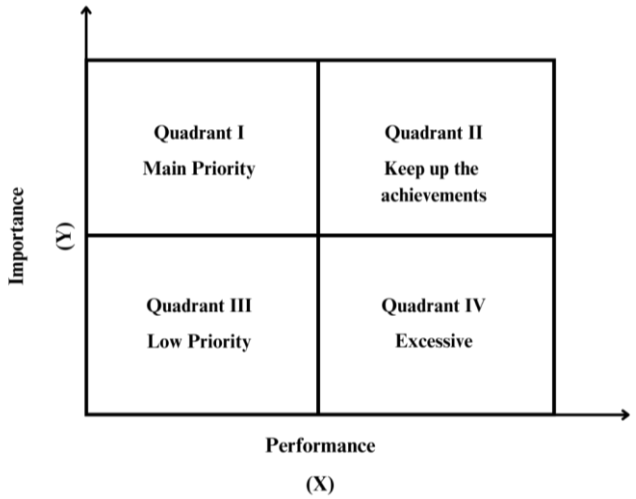

Fig. 1 Cartesian diagram of important performance analysis

2.6 Customer Satisfaction Index

Customer Satisfaction Index (CSI) method is an indicator used to measure the level of overall consumer satisfaction by evaluating the importance of the product or service attributes measured [14-15]. The method has the benefits of high efficiency, not only the satisfaction index, but also information about dimensions/attributes that need development, usability, simplicity, and a relatively high sensitivity and reliability of the scale employed [16]. In this method there are several variables that need to be calculated, there are determine Mean Important Score (*MIS*) and Mean Satisfaction Score (*MSS*), Weighted factor (*Wf*), Weighted Score (*WS*), Weighted Total (*WT*), and the last is CSI value. In this study, Likert scale analysis [17] was utilized to quantitatively evaluate respondents' responses. Likert scale is used to measure a person's or group's attitudes, opinions, and perceptions regarding social phenomena. The Likert scale is shown in Table 3.

Table 3 Likert scale score table

Value	Performance level	Interest level
1	Very unsatisfying	Very unimportant
2	Unsatisfying	Unimportant
3	Enough	Quite important
4	Satisfying	Important
5	Very satisfying	Very important

To obtain accurate responses, a preliminary questionnaire was distributed to passenger who use KRL line Cikarang – Sudirman Station of 30 people on the basis of a convenient sampling. The final questionnaire mapped the scale from 1 to 5 points like the Likert scale table above that was discussed earlier. Before the next analysis process is carried out, the instruments used in this study are tested for accuracy (validity) where If r-count value ≥ r-table (valid) and If r-count value < r-table (invalid) and reliability (reliability) when variable is deemed or trustworthy if it yields a Cronbach's Alpha value over 0.70 [18]. Both are analysed with using the SPSS program, in subsequent analyses, only instruments that were declared valid and reliable were used in research. The surveys were conducted at stations in the morning and afternoon on different days in a week and used social media platform to distribute the questionnaire. The questionnaires were randomly given face-to-face to passengers, moreover the questionnaire was distributed within 3 (three) weeks after the minimum standard observation at Sudirman station.

3. Results and Discussion

This research was conducted inside the KRL Commuter Line Cikarang – Sudirman and at Sudirman Station located Jl. Kendal 1, Menteng, Central Jakarta. The survey was executed for a month, from Monday to Friday, and holidays on Saturdays, for each direction Cikarang – Sudirman and vice versa. The average passengers of Sudirman Station are 591,265 passengers/month (May 2022 ~ May 2023) [4], then the number of samples can be determine using Slovin's formula (Eq. 1),

$$n = \frac{591{,}265}{1+(591{,}265 * 0{,}1^2)} = 99.98 \text{ samples} \approx 100 \text{ respondents.}$$

Data collection methods include (i) Observation and documentation i.e. by directly observing the condition of passengers on the train and the infrastructure at the station, then records it to the devices in the form of photos and videos and (ii) Direct interview and distribute closed questionnaire including social media platform, both are recorded in Google form.

3.1 Respondent characteristic

(1) Characteristics of respondents based on gender

The results of respondent characteristics derived from the results of primary data collection carried out through the distribution of questionnaires based on gender groups are as follows (Table 4).

Table 4 Respondent data based on gender

Gender	Number	Percentage
Men	70	70%
Woman	30	30%
Sum	100	100%

(2) Characteristics of respondents based on age

Table 5 shows the respondents' age distribution. It is revealed that out of a total of 100 respondents, the majority, constituting approximately 66%, fall within the age range of 15 ~ 25 years, and the age group of 26–35 years is accounted for approximately 18% of the respondents. Hence the majority respondents are in age range between 15 ~ 35 years, corresponds 84% of the sample populations.

Table 5 Respondent data based on age

Age	Number	Percentage
15 ~ 25	66	66%
26 ~ 35	18	18%
36 ~ 45	11	11%
>45	5	5%

(3) Characteristics of respondents based on occupations

Table 6 presents that majority of respondent area student and employee covering 83% of respondent.

Table 6 Respondent data based on occupation

Occupation	Number	Percentage
Student	53	53%
Employee	30	30%
Entrepreneur	6	6%
Civil servant	2	2%
Freelance	6	6%
Others	3	3%

3.2 Validity test and reliability test

The validity test was used to ascertain the validity of the questionnaire. Following to methodology used in this research, the validity test is performed by comparing the calculated value with the r-table value with the degree of freedom (df) = n – 2, where n is the sample size. The criteria for validity testing are as follows: (1) If r – count value ≥ r – table then the instrument or question item has a significant correlation with the total score (valid statement). However, (2) If r – count value < r – table, the instrument or question item does not correlate significantly with the total score (declared invalid). In addition, the requirement to pass the validity test is to use the significance value (P-value) as follows: (1) If the significance value < 0.05 the query is deemed valid. However, (2) If the significance value > 0.05 the query is deemed invalid.

In this study, validity testing was conducted using SPSS version 2.2. The result of the validity test of 36 sample against

actual data is that all 36 questions of questionnaire are declared valid which means that the r – value > r – table value = 0.361. Hence, it can be concluded that all questions are valid and can be continued for reliability test.

The reliability test is a tool for measuring research questionnaires that are indicators of a variable or structure. Reliability tests are also used to test the consistency of data held over a period of time, that is, to find out the extent to which the measurements used are reliable or trustworthy. The methodology used in this research involves the utilization of Cronbach's Alpha (α), a measure of internal consistency dependability. A structure or variable is deemed trustworthy if it yields a Cronbach's Alpha value over 0.70. To ease the computation of this reliability test, computer aids and the Statistical Package for Social Science (SPSS) version 2.2 are used. Further to this, the calculation of reliability test shows that result of performance data by respondent on the train is 0.849. While result of reliability test of performance data by respondent at the station is 0.912 and the result of reliability test of expectation data by respondent at the station is 0.933, and result of reliability test of expectation data by respondent on the train is 0.919. As all the Cronbach's Alpha value ≥ 0.7, therefore, it can be concluded that each of these inquiries is reliable.

3.3 Important Performance Analysis

After all questionnaire questions were declared valid and reliable, questionnaires were distributed at several points of the Cikarang – Sudirman station line. A total of 160 questionnaires were carried out and 100 effective responses were received during the study in accordance with the calculated populations. To measure the level of performance and expectations of each question attribute, this study used the Likert scale as in Table 3 as a reference for the research scale. The average score on each attribute is then calculated. Table 7 presents the recapitulation of performance score and expectations.

Table 7 Recapitulation of performance score and expectations

Analysis	Average total score (ΣX_1 & ΣY_1)	Average score ($\bar{\bar{X}}_i$ & $\bar{\bar{Y}}_i$)
Performance at the station	80.52	3.66
Performance on the train	49.50	3.54
Passenger expectations at the station	92.47	4.20
Passenger expectations on the train	58.8	4.20

Conformity rate is a comparison between the total performance score and the total expectation score. The higher the percentage of conformity level on an attribute, the higher the passenger's satisfaction with that attribute. The average match between performance and expectations at the station is 88.21%. The attribute that has the highest level of conformity is attribute 5 regarding availability of security facilities such as CCTV and complaint phone number sticker if there is a security disturbance. While the attribute that has the lowest level of conformity is attribute 21 regarding availability of special elevator or lane for passengers using wheelchairs and the average match between performance and expectations on the train is 84.71%. The attribute that has the highest level of conformity is attribute 35 regarding Information about stop stations and disturbances during the KRL trip (via visual or audio). While the attribute that has the lowest level of conformity is attribute 24 regarding availability of First aid kit in each train series (minimum 1 set). And the last step of IPA methods is making a Cartesian diagram. Fig. 2 and 3 shows the Cartesian Diagram of Performance and Expectation at the Station and on the Train. While the Table 8 and 9 show the detail of the division of the four assessment quadrants and each attribute.

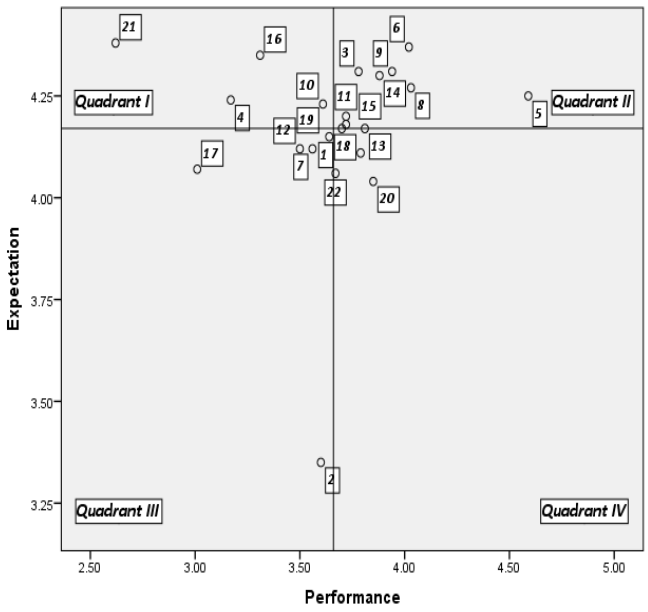

Fig. 2 Cartesian diagram of performance and expectation at the station

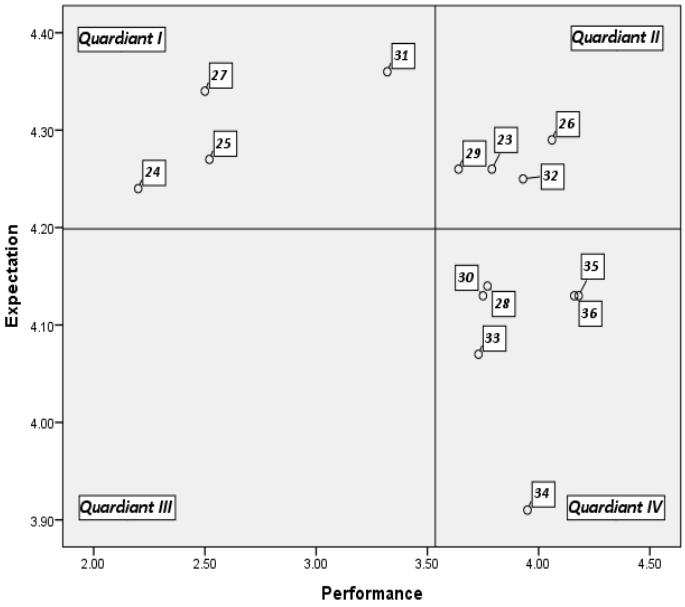

Fig. 3 Cartesian diagram of performance and expectation on the train

Table 8 Attributes at the station based on Cartesian diagram

Quadrant	No.	Attributes at the station
I	4	The height difference of the station platform floor is not more than 20 cm with the railroad floor.
	10	Seating facilities in the waiting room is clean and maintained for 1 (one) person with a minimum of 0.6 m^2
	16	Passengers service facilities such as work desks
	21	A special elevator or lane for passengers using wheelchairs
	1	Safety facilities such as fire extinguishers, evacuation gathering points, alarm buttons for emergency conditions and emergency call
II	3	Platform canopy to protect passengers from heat and rain
	5	Security facilities such as CCTV
	6	Security officers/personnel
	8	Manual top-up lockets and/or vending machines along with procedures for purchase and top-up
	9	Operation schedule board and KRL service network map
	11	Availability of toilet and mosque facilities in clean and maintained conditions
	14	Information on station plans, schedule, and train fares in the form of visuals (information screens) and audio
	19	Disabled toilets
	2	Health facilities such as first aid kit, stretcher, and wheelchair,
III	7	A complaint phone number sticker if there is a security disturbance
	12	Air circulation control facilities such as air conditioner or fans with a maximum temperature of 27°C in the waiting room
	17	Ample and safe vehicle parking space for 2-wheeled or 4-wheeled vehicles
	18	Ramp a maximum slope of 10° and access roads connecting between platforms
	13	Lighting facilities with appropriate light intensity
IV	20	Pedestrian path with building blocks for passengers with special needs
	22	Lactation room (Nursing room)

Table 9 Attributes on the train based on Cartesian diagram

Quadrant	No	Attributes on the train (KRL)
I	24	First aid kit in each train set (at least 1 set)
	25	A space capacity to carry standing passengers' maximum 1m^2 for 6 people (no crowding)
	27	CCTV in the train (at least 2 (two) CCTV in 1 (one) train)
	31	Punctuality of departure or arrival time
II	23	Safety facilities such as fire extinguishers (at least 1 piece) in each train, emergency buttons for emergencies, automatic door opening levers, evacuation instructions, and emergency phone numbers are available
	26	The door works well
	29	Complaint phone number stickers in case of security disturbances
	32	Hand grip (for standing passengers) and luggage rack above the seat
III		-
IV	28	Uniformed officers who are ready to assist passengers equipped with attributes and assistive devices
	30	Lighting that works properly
	33	Air conditioner/fan or air ventilation with a maximum temperature of 27°C
	34	A cleaner who always cleans the train during the trip
	35	Information on stopping stations and disruptions during KRL travel (via visual or audio)
	36	Priority seats at every corner of the train for special needs passengers (pregnant women, elderly, people with disabilities, and passengers with toddlers)

At the station, the average score of the average performance score ($\overline{\overline{X}}$) at the station is 3.66 and the average value of the average expected score ($\overline{\overline{Y}}$) is 4.20. Table 8 shows the attribute of each quadrant according to the assessment given by the user. Based on the Cartesian diagram above, in quadrant 1 the attributes at the station that need to be improved are: (1) The height difference of the station platform floor is not more than 20cm with the railroad floor, (2) Seating facilities in the waiting room is clean and maintained for 1 (one) person with a minimum of 0.6 m^2, (3) Passengers service facilities such as work desks, and (4) A special elevator or lane for passengers using wheelchairs.

On the train, the average value of the average performance score ($\overline{\overline{X}}$) in KRL travel is 3.54 and the average value of the average expected score ($\overline{\overline{Y}}$) is 4.20. Table 9 shows the attribute of each quadrant according to the assessment given by the user. As shows on quadrant 1, the attributes that need to be improved and worth paying attention to the quality again include 4 attributes, namely, (1) First aid kit in each train set (at least 1 set), (2) A Space capacity to carry standing passenger's maximum 1m^2 for 6 people (no crowding), (3) CCTV in the train (at least two CCTV in one train), and (4) Punctuality of departure or arrival time.

3.4 Customer Satisfaction Index

In this study, the Customer Satisfaction Index (CSI) was measured to determine consumer satisfaction and served as a benchmark for determining future objective goals. The steps involved in calculating the Customer Satisfaction Index from each attribute obtained from questionnaire responses. This includes the computation of Mean Important Score (*MIS*) and Mean Satisfaction Score (*MSS*), the Weight Factor and Weight Score before the Customer Satisfaction Index can be calculated.

The calculation of CSI outcome is 71.60 where the value is in the interval 66.00-80.00 which means consumers are "satisfied" with the performance carried out by PT KAI Commuter Jabodetabek on the Cikarang-Sudirman KRL Commuter Line. This result shows that from all attributes of 71.60% consumers are satisfied with the performance provided and 28.40% of services are not satisfied leaving some note that need to be evaluated to solve the gap between the expectations of consumers and the quality of services provided.

4. Conclusions

As a result of the analysis of a survey conducted the following conclusions can be made. Services provided at Sudirman Station have 89.9% met the minimum standards service as regulated on the Transportation Ministerial Regulation No. 63/2019. Still there are lacking or not yet met the regulations for instance plafond roof that has not been fully installed, no work desk for customers, unavailability of vehicle parking, and there is no elevator for disabled passengers. The services on the KRL train have 94.5% met the minimum standards services. Some small but important services need to be provided such as the first aid kit (P3K) boxes and CCTV in each carriage.

The Important Performance Analysis (IPA) shows the level of conformity between performance and passenger expectations at Sudirman Station states that there are four attributes need to be prioritized to improve their performance including: (1) The height/width difference of the station platform floor is not more than 20 cm with the railroad floor (2) Seating facilities in the waiting room is (3) Passengers service facilities such as work desks (4) Special elevator (lift) or lane for passengers using wheelchairs. While the level of conformity between performance and passenger expectations in KRL (trip)/on the train states that there are 4 (four) attributes that need to be prioritized to improve performance, including (1) First aid kit in each train set (at least 1 set), (2) Space capacity to carry standing passengers is maximum $1m^2$ for 6 people (no crowding), (3) CCTV in the train (at least two CCTV in one train), (4) Punctuality of departure or arrival time. The Customer Satisfaction Index (CSI) analysis on the performance of KRL at the station and on the train produced CSI value of 71.60% which means most of the costumers are satisfied with the performance of the services provided.

References

[1] S. Fatimah, Pengantar Transportasi, Ponorogo: Myria Publisher, 2019.
[2] S. A. Rosyidi, Rekayasa Jalan Kereta Api, Yogjakarta: Lembaga Penelitian, Publikasi dan Pengabdian Masyarakat Universitas Muhammadiyah Yogyakarta, 2015.
[3] KAI Commuter, "Commuterline.id," Commuterline.id, November 20, 2022. [Online]. Available: https://commuterline.id/informasi-publik/berita/sampai-minggu-ketiga-november-hampir-13-juta-pengguna-dilayani-kai-commuter. [Accessed: April 2023].
[4] KAI Commuter, "Commuterline.id," Commuterline.id, July 16, 2024. [Online]. Available: https://commuterline.id/informasi-publik/berita/unjukkan-tren-positif-volume-pengguna-commuter-line-jabodetabek-dekati-angka-1-15-juta-orang-per-hari.
[5] Kompas.com (Director), "Saat Penumpang Keluhkan Pelayanan KRL Jabodetabek," [Motion Picture], 2022.
[6] Kementerian Perhubungan Republik Indonesia, Peraturan Menteri No 63 tahun 2019 tentang Standar Pelayanan Minimum Angkutan Orang dengan Kereta Api, Jakarta, 2019.
[7] A. Parasuraman, V. A. Zeithaml, and L. L. Berry, "SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality," Journal of Retailing, vol. 64, no. 1, pp. 12-37, 1988.
[8] F. Tjiptono, Strategi Pemasaran, Prinsip dan Penerapan, Yogjakarta: Penerbit Andi, 2020.
[9] P. Kotler and G. Armstrong, Prinsip Prinsip Pemasaran, Jakarta: Erlangga, 2018.
[10] P. Kotler and K. Keller, Manajemen Pemasaran, Jakarta: Erlangga, 2009.
[11] L. Gay and P. Diehl, "Research Methods for Business and Management," in R. Hill, Ed., What Sample Size Is "Enough" in Internet Survey Research?, Interpersonal Computing and Technology, vol. 1, no. 3-4, pp. 45-52, 1998. Retrieved from http://www.emoderators.com/ipct-j/1998/n3-4/hill.html
[12] I. Ghozali, Aplikasi Analisis Multivariate Dengan Program IBM SPSS 25, Semarang: Badan Penerbit Universitas Diponegoro, 2018.
[13] J. Martilla and J. James, "Importance Performance Analysis," Journal of Marketing, 1977.
[14] K. R. Bhote, Beyond Customer Satisfaction to Customer Loyalty: The Key to Great Profitability, New York, 1996.
[15] D. Devani and R. Rizko, "Analisis Kepuasan Pelanggan dengan Menggunakan Metode Customer Satisfaction Index (CSI) dan Potential Gain in Customer Value (PGCV)," vol. 2, no. 2, 2016.
[16] L. D. Anggraini, P. Deoranto, and D. M. Ikasari, "Analisis Persepsi Konsumen Menggunakan Metode Importance Performance Analysis dan Customer Satisfaction Index," Industria: Jurnal Teknologi dan Manajemen Agroindustri, vol. 75, 2015.
[17] Sugiyono, Metode Penelitian Kuantitatif, Kualitatif, dan R&D, Bandung: Alfabeta, 2010.
[18] K. S. Taber, "The Use of Cronbach's Alpha when Developing and Reporting Research Instruments in Science Education," 2018.