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Analysis of Operational Performance and Service of the Jenggala Commuter Train (Route Surabaya Kota – Mojokerto)

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ABSTRACT
This research aims to analyze the operational performance and facilities availability at the stations for the Jenggala Commuter Train connecting Surabaya Kota with Mojokerto. Through data collection and analysis, this study will evaluate issues frequently experienced by passengers such as improper departure times, delays, overcrowding, and ticket availability. Additionally, it will assess the service provided by the operators regarding passenger satisfaction with the Jenggala commuter service. The next step involves comparing the analysis results with applicable standards to identify appropriate solutions and recommendations to enhance the efficiency and quality of mass transportation services in urban areas of Indonesia, particularly in East Java. It is hoped that the findings of this research will significantly contribute to improving sustainability and the quality of life for communities through the enhancement of existing transportation systems. The operational performance has been assessed through several parameters. It was found that the load factor and punctuality of journeys have met the established standards. However, travel speed has not yet reached the desired standard. Through the Importance Performance Analysis (IPA) method, an evaluation of the Jenggala commuter train service was conducted by considering both low and high priority service attributes. This aims to ensure that the service performance meets the needs of passengers. The results of the passenger satisfaction level analysis using the Customer Satisfaction Index (CSI) method indicate that the overall satisfaction rating for the Jenggala commuter train service falls within the "satisfied" category. Thus, these findings provide insights into areas where operational performance can be improved and offer an understanding of passenger needs and expectations that can serve as a focus for improvement in the future.

Keywords: *Jenggala Commuter, Importance Performance, Operational Performance*

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INTRODUCTION

Transportation plays a vital role in supporting connectivity and mobility, especially amid rapid technological advancements, population growth, and urbanization. This necessitates improvements in the quality and efficiency of transportation systems, a

pressing need in many countries, including Indonesia. In this context, the field of civil engineering plays a key role in the planning, design, and management of transportation infrastructure. Research in transportation civil engineering is crucial for understanding the complexities of modern transportation systems and finding innovative solutions to address various challenges.

Technological advancements and changing societal needs drive the need for further investigation into aspects such as route analysis, road capacity, safety, affordability, and the integration of technology to enhance the efficiency and sustainability of transportation systems. Additionally, issues related to environmental impact, urban competitiveness, and mass transportation integration are essential elements in the development of sustainable transportation systems. Therefore, research in transportation civil engineering not only encompasses technical and technological aspects but also involves urban planning and environmental sustainability elements.

In Indonesia, land transportation, such as highways and railways, serves as the backbone of public mobility. Railways, in particular, are a popular transportation choice due to their relatively low cost, safety, and freedom from traffic congestion. Surabaya, as the second-largest city in Indonesia, experiences significant mobility increases, especially from surrounding areas like Mojokerto, Sidoarjo, and Gresik. Every day, traffic towards Surabaya is congested with workers using both private and public transportation, including commuter trains.

The Jenggala Commuter Train, which connects Surabaya Kota with Mojokerto, is one of the mass transportation solutions to address congestion and meet the mobility needs of the public. However, the operation of the Jenggala Commuter Train still faces various challenges, such as punctuality of departures and arrivals, as well as passenger comfort and satisfaction. These issues cause inconvenience and losses for passengers, particularly workers who need to arrive on time at their workplaces.

Therefore, this study aims to analyze the operational performance and passenger satisfaction levels of the Jenggala Commuter Train on the Surabaya Kota – Mojokerto route. This research is expected to make a significant contribution to improving the efficiency, sustainability, and quality of railway transportation services in Indonesia. The analysis will refer to the standards set by the Ministry of Transportation and employ the Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI) methods to measure user satisfaction levels.

Thus, this study is not only relevant for the development of knowledge and technology in the field of transportation civil engineering but also has practical benefits for railway operators, local governments, and public transportation users.

RESEARCH METHODOLOGY

Quantitative research methods use a quantitative approach in data collection and analysis. The goal is to test hypotheses and find relationships between the variables being studied. The application methods in quantitative research involve data collection through

surveys, experiments, or secondary data analysis. This research is more structured, with the use of research instruments that can be numerically measured.

Some key characteristics of quantitative research include:

1. Hypotheses and Variables: Quantitative research often involves formulating testable hypotheses and identifying the variables involved.
2. Data Collection: Data is collected through methods such as surveys, experiments, or secondary data analysis. The data is often numerical.
3. Statistical Analysis: Data analysis is conducted using statistical techniques to test hypotheses and draw conclusions.
4. Objectivity: Quantitative research strives for objectivity by using measurable and repeatable methods.
5. Generalization: The results of quantitative research are often intended to be generalized to a larger population.

According to Rakhmat (2002), a population can be defined as a collection of research objects, which can be people, organizations, institutions, books, etc. This population is the entirety of the units of analysis that have the characteristics to be identified in the research. In the context of the mentioned study, the population is all the passengers of the Jenggala Commuter Train on the Surabaya – Mojokerto route.

A sample, on the other hand, is a part of the population that possesses the same characteristics. Although the sample size is relatively small, it must represent the traits and properties of the entire population. This definition is given by Sugiyono (2003), who explains the importance of a sample as an adequate representation of the overall population in research.

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

Explanation :

n = Number of samples

N = Number of population

D = Precision value of 10% or error rate (Rakhmat, 2001:82)

The use of Accidental Sampling in this research refers to the selection of samples based on chance or accessibility by the researcher. In this context, respondents are chosen based on their availability and proximity, making them easily accessible to the researcher. While this technique is often used for its practicality, it is important to note that the results from samples taken using this method may not be fully representative of the broader population. For data analysis, groups of data related to the RK-THB commuter rail connection are required. The data used consists of primary and secondary data as outlined below.

a. Permissions and Cooperation:

A letter is submitted to obtain permission or approval from PT KAI Indonesia to use secondary data in this research.

b. Primary Data Collection Method:

Primary data is collected by surveyors on the train and at stopping stations.

c. Primary Data Collection Instrument:

A questionnaire form is used to collect passenger satisfaction data. There are several questions on the questionnaire.

d. Recording Procedure at Stopping Stations:

Manual counting methods are used to record passengers disembarking at their destination stations.

e. Safety and Ethics:

Measures are taken to ensure safety and ethics in data collection, including the protection of passengers' personal data.

Providing this information in a detailed and clear manner demonstrates transparency and credibility in the research, as well as respect for copyright and consent from secondary data sources.

In analyzing operational performance based on the mentioned regulations, the following main variables will be analyzed:

a. Load Factor:

The load factor is the ratio of the number of passengers carried by the commuter train.

b. Operating Speed:

The operational speed of the commuter train during travel is calculated by dividing the distance traveled by the travel time (km/h).

c. Punctuality:

Journey punctuality is determined with a delay value that must not exceed 20% of the total actual travel time.

d. Importance Performance Analysis (IPA):

IPA is conducted to represent passenger satisfaction levels by comparing performance and service received against passenger expectations.

e. Customer Satisfaction Index (CSI):

The CSI value is calculated to determine the overall passenger satisfaction level based on the quality of service received.

The location for this research is Surabaya Kota station, located at JL. Stasiun 9, Surabaya, East Java 60161. The timing is adjusted to the departure schedule from Surabaya Kota station from 4:00 PM to 5:35 PM local time.

RESULT AND DISCUSSION

a. Operational Performance of the Jenggala Commuter Train

Based on the results obtained from the operational performance of the Jenggala commuter train, the following discussion is presented.

1. Load Factor:

During the fourteen-day survey period, the average load factor on weekends reached 64.485%, while on weekdays it only reached 41.931%. Although these figures are still below the 100% threshold, the load factor during weekdays does not meet the

desired ideal standard of 65%. This significant decrease is especially noticeable during peak hours, where there is a stark difference in passenger numbers between weekdays and weekends. During the survey period, Gubeng Station was the busiest boarding point, but the majority of passengers disembarked at Mojokerto Station, causing significant fluctuations in the load factor on weekdays.

2. Travel Speed:

Over the fourteen-day survey period, the average travel speed between Surabaya Station and Mojokerto Station was 48.113 km/h. Although this speed is below the maximum permitted limit of 70 km/h, it is also far below the target operational speed of 67 km/h. The Jenggala commuter train only reached its highest operational speed between Krian Station and Tarik Station, at 57.571 km/h.

3. Punctuality:

During the fourteen-day survey period, the average delay between Gubeng Station and Wonokromo Station was 9.183%. This figure indicates excellent performance, as it is well below the permitted delay threshold for commuter trains, which is 20%.

4. Service Performance Using Importance Performance Analysis (IPA)

After grouping all indicators based on their respective quadrants, the following discussion of the analysis results is provided.

- Quadrant A:

Indicators in Quadrant A are service attributes considered important by passengers and whose performance meets passenger expectations, thus their performance needs to be maintained. The explanations for each indicator in Quadrant A are as follows:

Indicator 1: Ticket prices are commensurate with the level of service provided.

Indicator 2: Employees on the Commuter Train show good, respectful, and friendly attitudes.

Indicator 3: Safety equipment such as fire extinguishers (APAR), emergency levers, and manual door openers are available for use on the Commuter Train.

Indicator 4: Health equipment (First Aid Kits) is available on the Commuter Train or carried by staff for emergency purposes.

Indicator 5: Commuter Train doors operate properly and as intended.

Indicator 6: Lighting in the Commuter Train works well and fulfills its function effectively.

Indicator 7: The Commuter Train operates punctually for both departures and arrivals.

Indicator 8: Comfortable seating and standing spaces are available for passengers in the Commuter Train.

Indicator 9: Air conditioning in the Commuter Train works well.

Indicator 10: Adequate and well-functioning hand grips are available for standing passengers to feel comfortable and safe.

Indicator 11: Adequate luggage racks are available to store passengers' belongings safely and comfortably.

Indicator 12: The train is always clean and free from unpleasant odors at all times.

Indicator 13: Clear audio information about the journey is available to guide passengers.

b. Service Performance Using the Customer Satisfaction Index (CSI)

Based on the calculations, the passenger satisfaction index for the Jenggala commuter train was found to be 89.109%. This value falls within the range of 81% < CSI ≤ 100%, indicating that the service attributes of the commuter train meet the passengers' expectations effectively.

CONCLUSION

The conclusion is intended to help the reader understand why your research should matter to them after they have finished reading the paper. A conclusion is not merely a summary of the main topics covered or a re-statement of your research problem, but a synthesis of key points. It is important that the conclusion does not leave the questions unanswered.

Tips:

1. State your conclusions clearly and concisely. Be brief and stick to the point;
2. Explain why your study is important to the reader. You should instill in the reader a sense of relevance;
3. Prove to the reader, and the scientific community, that your findings are worthy of note. This means setting your paper in the context of previous work. The implications of your findings should be discussed within a realistic framework, and;

For most essays, one well-developed paragraph is sufficient for a conclusion, although in some cases, a two or three paragraph conclusion may be required. The another of important things about this section is (1) do not rewrite the abstract; (2) statements with "investigated" or "studied" are not conclusions; (3) do not introduce new arguments, evidence, new ideas, or information unrelated to the topic; (4)do not include evidence (quotations, statistics, etc.) that should be in the body of the paper.

ACKNOWLEDGEMENT

Based on the analysis and discussion regarding the operational performance and passenger satisfaction levels with the services of the Jenggala Commuter Train, the following conclusions can be drawn:

1. The load factor and punctuality are two aspects of operational performance that have met the established standards. However, the travel speed has not yet met the desired standard.
2. Applying the Importance-Performance Analysis (IPA) method to the service performance of the Jenggala Commuter Train revealed that several service attribute statements, whether of low or high priority, need improvement to meet passenger expectations.

3. Based on the analysis using the Customer Satisfaction Index (CSI) method, the passenger satisfaction level for the Jenggala Commuter Train is classified as "satisfied."

Based on this thesis research, the following recommendations can be provided:

Actions that can be taken to improve facilities for wheelchair users on the commuter train include providing dedicated spaces in each carriage to accommodate their needs.

Future research could employ other methods for analyzing passenger satisfaction levels..

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