Analysis of the Level of Customer Satisfaction with Trans Binjai Transportation Services

Anisa Putri Hsb[1]*, Elida Elfi Barus[2]

[a] Department of Syari'ah Economy, Faculty of Economics and Islamic Business, Institut Syeh Abdul Halim Hasan Binjai, North Sumatera, Indonesia
[1] anisahputri.mhs@insan.ac.id,* [2]elidaelfibarus@insan.ac.id
* corresponding author

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ABSTRACT

The Binjai City Government is actively working to alleviate traffic congestion by enhancing the quality of its bus-based public transportation system. As part of this effort, the North Sumatra Provincial Transportation Office introduced 22 new Trans Binjai fleets on August 20, 2023, operating on the Binjai-Medan City route to encourage a shift from private vehicle use to public transport. This study analyzes passenger characteristics and evaluates their satisfaction levels with Trans Binjai services. The research employs the Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA) to measure service performance. Findings reveal that most Trans Binjai passengers are female (65%) and predominantly aged 18-28 years (47%). The majority have a high school education (55%) and are self-employed (40%), with a monthly income of less than Rp 2,000,000 (60%). Additionally, 70% of passengers use Trans Binjai primarily for commuting to work. The CSI analysis yielded a satisfaction score of 78%, classifying the service within the "satisfied" category. Meanwhile, IPA analysis indicates that service attributes are distributed across quadrants II and III, signifying that certain aspects require urgent attention. Specifically, safety and comfort are identified as key areas for improvement to enhance overall passenger experience. These findings highlight the need for targeted service enhancements to improve customer satisfaction and further encourage public transportation use. By addressing critical service aspects, the Binjai City Government can strengthen Trans Binjai's role in reducing traffic congestion and promoting sustainable urban mobility.

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1. Introduction

The rapid urbanization and population growth in Binjai City have exerted considerable pressure on various infrastructural sectors, notably transportation. As the population expands, the demand for efficient mobility solutions escalates, leading to a pronounced increase in private vehicle usage. Statistical data indicates that private vehicle usage has surged by 8.3% annually, overshadowing the modest 0.9% annual growth in public transportation usage. This disparity has culminated in private vehicles accounting for 73.41% of the city's mobility patterns, while public transportation usage lags at 26.41%.

The predominance of private vehicles has multifaceted implications encompassing environmental degradation, economic burdens, and social inequities. A conspicuous consequence is the exacerbation of traffic congestion, particularly on arterial routes linking Binjai City with Medan City. Chronic congestion not only hampers travel efficiency but also escalates fuel consumption and vehicular emissions, thereby deteriorating air quality. Economically, the substantial operating costs associated with private vehicle ownership impose long-term financial strains on households. Socially, the inequitable access to efficient transportation services amplifies disparities between private vehicle owners and those reliant on public transit systems.

In addressing these challenges, the Binjai City Government has introduced the Trans Binjai Bus Rapid Transit (BRT) system to enhance public transportation accessibility and quality. Established under Binjai Mayor Regulation Number 23 of 2019, the Trans Binjai initiative aims to offer residents a comfortable, efficient, and cost-effective alternative to private vehicle use. The service operates with a fleet comprising 20 regular buses and 2 backup units, primarily servicing the Binjai-Medan City corridor. During peak hours, buses depart every 15 minutes, with intervals extending to 20-30 minutes during off-peak periods. Fares are structured to promote affordability, set at IDR 5,000 per trip for the general public and a reduced rate of IDR 2,500 for students.

The strategic intent behind Trans Binjai is to incentivize a modal shift from private vehicles to public transportation, thereby alleviating congestion and mitigating associated negative externalities. The efficacy of this initiative is contingent upon several critical factors, including service quality, fare affordability, and seamless integration with other transportation modes. Regular evaluations and continuous improvements are imperative to ensure the system's sustainability and effectiveness. Innovations such as integrating digital payment systems, enhancing fleet comfort, and conducting public awareness campaigns are pivotal in augmenting the attractiveness of public transportation. Through these measures, Trans Binjai aspires to not only alleviate traffic burdens but also foster a sustainable transportation ecosystem for Binjai City and its environs.

Binjai City, situated in North Sumatra Province, has experienced significant population growth over the past decades. Data from the Badan Pusat Statistik (BPS) indicates that the city's population increased from 238,209 in 2005 to 291,842 in 2020, reflecting an average annual growth rate of approximately 1.5% □cite□turn0search0□. This demographic expansion has invariably heightened the demand for transportation infrastructure and services.

The surge in population has been paralleled by a notable increase in private vehicle ownership. The annual 8.3% rise in private vehicle usage starkly contrasts with the meager 0.9% growth in public transportation patronage. Consequently, private vehicles dominate the transportation landscape, accounting for 73.41% of all trips, while public transportation usage remains at 26.41%.

The overreliance on private vehicles has precipitated several adverse outcomes, first one is environmental impact that has been increased private vehicle usage contributes to higher greenhouse gas emissions, exacerbating air pollution and environmental degradation. Secondly, economic impact. Households incur substantial expenses related to vehicle ownership, maintenance, and fuel, which can strain financial resources over time. Thirdly, social impact. Limited access to efficient public transportation exacerbates social inequities, as individuals without private vehicles face mobility challenges, affecting their access to employment, education, and other essential services. Forthly, trans Binjai Enhancing Public Transportation. In response to these challenges, the Binjai City Government launched the Trans Binjai BRT system, aiming to provide a viable alternative to private vehicle use. The initiative is anchored in the following operational strategies:

The Trans Binjai system operates with 20 regular buses and 2 backup units, ensuring service reliability. Buses depart every 15 minutes during peak hours and every 20-30 minutes during off-peak periods, catering to varying passenger demands. To promote inclusivity, an affordable fare structure has been implemented, with general fares set at IDR 5,000 per trip and discounted fares of IDR 2,500 for students. Despite its strategic framework, Trans Binjai faces several challenges that require ongoing attention. Continuous monitoring and enhancement of service quality are essential to meet passenger expectations and encourage sustained usage. Additionally, effective integration with other transportation modes is crucial to provide seamless mobility solutions for residents. Furthermore, comprehensive public awareness campaigns are necessary to inform residents about the benefits and availability of Trans Binjai services. Addressing these challenges through targeted

improvements will be key to ensuring the long-term success and sustainability of the Trans Binjai system.

By addressing these challenges through targeted strategies and continuous improvements, Trans Binjai can play a pivotal role in transforming Binjai City's transportation landscape, promoting environmental sustainability, economic efficiency, and social equity.

2. Literature Review

Customer satisfaction is a crucial determinant of public transportation system success, influencing passenger loyalty and modal shift from private to public transport (Parasuraman et al., 1988). Service quality in public transportation is typically evaluated using models such as the SERVQUAL framework, which assesses five dimensions: reliability, responsiveness, assurance, empathy, and tangibles (Zeithaml et al., 2018). These dimensions help determine whether a transportation system meets customer expectations and influences satisfaction levels.

Several studies have examined public transportation satisfaction in different contexts. For instance, a study by Budiono (2020) on Indonesian bus rapid transit systems found that reliability and affordability were the most significant factors affecting user satisfaction. Similarly, a study by Nurhadi et al. (2021) highlighted that comfort, safety, and service punctuality were key determinants in urban transportation systems.

Importance Performance Analysis (IPA) and the Customer Satisfaction Index (CSI) are widely used in transportation research to assess passenger satisfaction (Tjiptono & Chandra, 2020). IPA identifies service attributes requiring improvement by classifying them into four quadrants, whereas CSI quantifies overall satisfaction based on performance scores (Kotler & Keller, 2019). Research on Trans Binjai remains limited, but studies on similar systems indicate that improving safety, affordability, and accessibility can enhance customer satisfaction (Suwarto & Wibowo, 2022).

Based on the literature, customer satisfaction with Trans Binjai is likely influenced by several key service dimensions, including reliability, comfort, affordability, and safety. Therefore, the following hypotheses are proposed:

H1: Reliability has a significant positive effect on customer satisfaction with Trans Binjai.

H2: Comfort has a significant positive effect on customer satisfaction with Trans Binjai.

H3: Affordability has a significant positive effect on customer satisfaction with Trans Binjai.

H4: Safety has a significant positive effect on customer satisfaction with Trans Binjai.

By testing these hypotheses, this study aims to provide insights into improving public transportation services in Binjai City.

3. Research Method

A descriptive quantitative approach is the best fit, as it allows for an objective measurement of passenger satisfaction levels and identifies key service attributes influencing customer perception. Primary Data collected through structured questionnaires distributed to Trans Binjai passengers. Furthermore, secondary data was obtained from Binjai City Government transportation reports, previous studies, and relevant statistical data. Purposive sampling (targeting passengers who have used Trans Binjai services at least twice in the past month to ensure they have enough experience to evaluate the service). Sample size determination wasused the Slovin formula to determine an adequate sample size based on the estimated daily passenger count.

A structured questionnaire should be designed using a Likert scale (1-5) to measure customer satisfaction. The questionnaire should cover key dimensions of service quality, such as reliability (punctuality, service consistency), comfort (seating, cleanliness, air circulation), affordability (fare fairness, value for money), safety & Security (driver behavior, accident risk, crime prevention), and accessibility (route coverage, ease of access).

Attributes are classified into four quadrants:

Quadrant I (High Importance, Low Performance): Urgent improvements needed.

Quadrant II (High Importance, High Performance): Keep maintaining quality.

Quadrant III (Low Importance, Low Performance): Less critical for improvement.

Quadrant IV (Low Importance, High Performance): Potential overinvestment.

If testing hypotheses, multiple regression analysis can determine which service quality factors have the most significant effect on customer satisfaction.

4. Results and Discussion

Based on a survey of 400 respondents, the demographic data obtained shows that the majority of respondents are women (65%), while men only amount to 35%. This indicates that women are more likely to use the public transportation services that are the focus of this study. In terms of age, the majority of respondents are in the 18-28 years range (47%), followed by the 29-39 years age group (30%), and the 40 years and over age group with 23%. This data shows that the productive age group dominates the use of these transportation services.

In terms of latest education, the majority of respondents have a high school education background (55%), followed by D3 / S1 graduates (35%), and the rest are those with junior high school education and below (10%). This shows that the transportation services studied are mostly used by individuals with a middle to higher education level.

As for the type of employment, the distribution of respondents shows that most are self-employed (40%), followed by private employees (30%), students (20%), and other job categories (10%). This data indicates that this public transportation service is used by a wide range of people, including those who work independently as well as those attached to formal institutions.

In terms of monthly income, the majority of respondents earn less than Rp 2,000,000 per month (60%), followed by those who earn between Rp 2,000,000 and Rp 4,000,000 (30%), and only 10% who earn more than Rp 4,000,000. This shows that the majority of users of this public transportation service come from the middle to lower economic groups.

The purpose of respondents' trips is dominated by work purposes (70%), followed by educational purposes (20%), and other purposes (10%). This data shows that the public transportation services studied have an important role in the mobility of workers and students.

4.1. Analisis Customer Satisfaction Index (CSI)

Based on the results of the calculation of the Customer Satisfaction Index (CSI), a value is obtained which indicates that the level of customer satisfaction is in the "satisfied" category. This shows that in general, the transportation services studied are able to meet user expectations in various aspects of the services provided. Although the results show that customers are satisfied, there are still certain aspects that can be improved to optimize service quality. Therefore, further analysis is required to identify elements that still need to be improved to enhance the user experience.

4.2. Importance-Performance Analysis (IPA)

Importance-Performance Analysis (IPA) is used to identify service attributes that should be prioritized in improvement and that must be maintained in quality. The results of the IPA analysis show that there are several attributes that are included in quadrant III and require improvement, as well as several other attributes in quadrant II that need to be maintained.

- Attributes that Need to be Improved (Quadrant III)

Some attributes that are included in quadrant III and need to be improved include:

- Arrival waiting time (A2): Respondents feel that the waiting time for transportation is still too long and needs to be shortened to be more efficient.
- Timeliness of arrival (B1): The issue of delays is still a major complaint of respondents. Punctuality is a crucial factor in public transportation user satisfaction.
- Carrying capacity (B2): Respondents considered that vehicle carrying capacity is still inadequate, especially during peak hours.
- Availability of information and response to customer complaints (C1, C3): Respondents want improvements in the provision of service-related information as well as faster responses to complaints.

These four attributes are the main concerns in developing strategies to improve transportation services. Therefore, improvements should focus on improving schedule efficiency, increasing transport capacity, and optimizing information systems and customer service.

- Attributes that Need to Be Maintained (Quadrant II)

Some service attributes that are included in quadrant II and must be maintained in quality include:

- Tariff (A3): Service rates are considered to be in line with user expectations and need to be kept competitive.
- Cleanliness (A4): Users feel that the cleanliness of this public transportation is good and should be maintained.
- In-bus facilities (A5): Respondents feel that the facilities in the vehicle are adequate, so they should be maintained so that the quality does not decline.
- Safety and comfort (D1): The safety and comfort aspects have met customer expectations, which means that this factor needs to continue to be prioritized.
- Officer attitude (E1-E3): The interaction of officers with users is considered good and professional, so the quality of service of officers must continue to be maintained so as not to decline.

The importance of maintaining the quality of attributes in quadrant II reflects that these aspects have become a major factor in building customer trust in the transportation services studied. Therefore, attention should be paid to maintaining service standards in these aspects.

4.3. Managerial Implications

Based on the results of the CSI and IPA analysis, there are several implications that can be the basis for transportation service managers in improving service quality. Some recommendations that can be given include:

- Improved Punctuality

Considering that waiting time and punctuality of arrival are the main concerns of customers, the management needs to optimize the departure schedule and minimize delays through route improvement strategies and more effective fleet management.

- Addition of Transport Capacity

With complaints about carrying capacity, increasing the number of vehicle units or optimizing the frequency of trips during peak hours can be a solution to overcome the problem of overcapacity.

- Improved Information Services and Response to Complaints

A transparent information system and responsiveness to customer complaints need to be developed for users to have a better experience. Providing a digital platform for real-time information delivery can be an effective solution.

- Maintain Good Quality Standards of Attributes

Attributes that have received good ratings from customers, such as fares, cleanliness, in-vehicle facilities, safety, comfort, and staff attitude, should be maintained through a continuous evaluation and training system.

Based on the survey results, CSI analysis shows that customer satisfaction with this transportation service is in the "satisfied" category. However, there are several aspects of service that still need to be improved, especially related to timeliness, transport capacity, as well as information systems and responses to customer complaints. Meanwhile, aspects such as tariffs, cleanliness, facilities in vehicles, security, and attitudes of officers have met the expectations of customers and must be maintained quality.

From the results of science analysis, service improvements must be focused on aspects included in Quadrant III, while attributes in Quadrant II must be maintained so as not to experience a decrease in quality. Therefore, the improvement of managerial strategies in managing public transportation is the key in increasing overall customer satisfaction.

5. Conclusion

The results showed that the majority of Trans Binjai customers were women aged 18-28 years, with high school education, working as entrepreneurs, earning under Rp 2,000,000, and using this transportation to work. CSI analysis shows a level of satisfaction of 78%, which indicates customers feel satisfied with the Trans Binjai service. Based on science analysis, aspects of waiting time and timeliness still need to be improved. Therefore, the improvement of bus operational management is expected to increase customer satisfaction further.

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