STUDY OF SURABAYA-MOJOKERTO TOLL ROAD SERVICE LEVEL USING THE CUSTOMER SATISFACTION INDEX (CSI) METHOD

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Abstract

Surabaya-Mojokerto toll road is the strategic linked of Surabaya with the cities on west area of East Java. It became a main national logistic route that also can increase the economic potential East Java. The vital aspects of the Surabaya-Mojokerto Toll Road need to be balanced with adequate services for toll road users. The purpose of this study is to improve the index value of toll road service using Customer Service Index (CSI) method. One of the main aspects that need to be considered is the satisfaction of toll road users so that the assessment of the services provided can be balanced. In this study, using a questionnaire method distributed online through the google form application. The respondents were addressed to users of the Surabaya-Mojokerto Toll Road within the last month. The questions in the questionnaire regarding to the Regulation of the Minister of Public Works and Public Housing Agency No. 16, 2014 by making several adjustments. The service level criteria for the toll road is “Satisfied” with a CSI value of 79.56. The pavement factor is the main factor that needs to be improved to increase the service value of the Surabaya-Mojokerto Toll Road.

Keywords: Toll Road, Toll Service, Customer Satisfaction Index

Article Info

Received 14 September 2021
Revised 04 October 2021
Accepted 15 October 2021

INTRODUCTION

The Surabaya-Mojokerto Toll Road is a toll road that has a length of 36.27 km and is divided into several sections, namely section IA Waru-Sepanjang (2.3 km), Section IB Panjang-Western Ring Road (4.3km), Section II WRR- Driyorejo (5.1km), Section III Driyos-Krian (6.1 km) and Section IV Krian-Mojokerto City (18.47 km). The Surabaya-Mojokerto Toll Road is a toll road that has been operated since 2011, it is critical because it connects the city of Surabaya with the western part of East Java Province.[1] The Surabaya-Mojokerto Toll Road will become the main national logistics route that can be passed well by toll road users so that it can increase economic growth in East Java Province. The crucial aspect of the Surabaya-Mojokerto Toll Road needs to be balanced with adequate toll road services for toll road users.

The main aspects that influence decisions on the use of performance indicators on the improvement of road such as the main characteristics of the road transport vision in the country concerned, the position of the road administration in the process of organizational reform, the management style of the organization, and the specific functions that require development or learning.[2]

Toll road operations are inseparable from service standards that must be realized. Regarding to Minimum Service Standards for toll roads are regulated in the Regulation of the Ministry of Public Works and Public Housing Agency Number 16 of 2014.[3] Many studies have been investigated about the satisfaction level of toll road in several cities of Indonesia. The most attributes that can influence the level of satisfaction for toll road users were divided into four groups, including product (product), place/ location (place), process (process), and physical evidence (physical evidence).[4] In previous study also has been investigated, it was also stated that seven service performance attributes were the top priority for improvement, namely: quality of street lighting, road surface, repair of road damage, toll fees, traffic accident problems, ambulance and rescue vehicle services, and official vehicle towing services.[5] However, the assessment factor of toll road users has a significant influence on the assessment of toll road services. Therefore, it is necessary in this study to involve toll road users so that the assessment carried out is balanced.

The Customer Satisfaction Index (CSI) method has been widely used to analyze the satisfaction level of toll road users in Indonesia. In previous research, using the CSI method, it was also known that the reliability and responsiveness of the toll road manager were variables that had a significant effect on customer satisfaction and also illustrated that customer satisfaction has quite a significant factor on the level of loyalty of toll road users.[6] Aspects of assessment in management managers have an important role that can increase user loyalty. But apart from that, it is also necessary to investigate other aspects that must also be continuously improved so that the expectations of toll
road users are in line with the development and improvement provided by the toll road manager.

Assessment of toll road user satisfaction really needs to be studied so that the PT. Jasa Marga as the toll road operator knows the level of expectations of toll road users. It is also intended that the toll road management can continue to improve facilities and services to toll road users. The existence of information on the assessment of the level of toll road service assessment by toll road users can also review a comprehensive relationship between service providers and toll road service users.

In this study, using a questionnaire method distributed online through the google form application. The respondents were addressed to users of the Surabaya-Mojokerto Toll Road within the last month. The questions in the questionnaire regarding to the Regulation of the Minister of Public Works and Public Housing Agency No. 16, 2014 by making several adjustments. The purpose of this study is to improve the index value of toll road service using Customer Service Index (CSI) method. Based on this, a Study of Service Level of the Surabaya-Mojokerto Toll Road was conducted using the Customer Satisfaction Index (CSI) method with reference to the Toll Road SPM.

RESEARCH METHODS

A. Toll Road

Toll roads are public roads that are part of the road network system and as national roads, for which users are required to pay tolls. The implementation of toll roads is intended to achieve equitable distribution of development and its results as well as balance in regional development by paying attention to justice, which can be achieved by fostering a road network whose funds come from road users. Part of the Government's authority in the administration of toll roads related to the regulation, exploitation, and supervision of business entities is carried out by the BPJT [7].

B. Minimum Service Standards Toll Road

The toll road operational supervision is carried out by the Ministry of Public Works and Public Housing Agency through the Toll Road Regulatory Agency. Supervision related to toll road services refers to the Standar Pelayanan Minimal (SPM) Jalan Tol as the Minimum Service Standard of Toll Road. Toll road SPM covers various aspects including Toll Road Conditions, Average Driving Speed, Accessibility, Mobility, Safety, Rescue/Rescue Units and Service Assistance, Environment, Rest Areas, and Rest and Service Areas [3]. The indicators in the Toll Road MSS aspect can be seen in Table 1.

| No. | Indicators                                      |
|-----|-----------------------------------------------|
| 1   | Toll Road Conditions                          |
| 2   | Pavement Condition of Main Road               |
| 3   | Drainage                                      |
| 4   | Median                                        |
| 5   | Roadside                                      |
| 6   | Rounding                                      |
| 7   | Average Driving Speed                         |
| 8   | Average Transaction Speed                     |
| 9   | Number of Vehicle Queues                      |
| 10  | Accessibility                                 |
| 11  | Mobilities                                    |
| 12  | Safety                                        |
| 13  | Street sign                                   |
| 14  | Other Facilities (public street lighting, glare foe, toll road space guardrail, safety fence) |
| 15  | Accident Handling                             |
| 16  | Security and Law Enforcement                  |
| 17  | Aid/Rescue Unit and Service Assistance        |
| 18  | Ambulance                                     |
| 19  | Crane Vehicle                                 |
| 20  | Highway Patrol Police                         |
| 21  | Toll Road Patrol                              |
| 22  | Rescue Vehicle                                |
| 23  | Information System                            |
| 24  | Environment                                   |
| 25  | Rest Area and Service Rest Area              |
| 26  | Pavement Condition on Rest Area              |
| 27  | On/off Ramp                                   |
| 28  | Toilet                                        |
| 29  | Parking Area                                  |
| 30  | Lighting                                      |
| 31  | Gas Station                                   |
| 32  | General Repair Workshop                       |
| 33  | Restaurant                                    |

Source: Regulation of the Minister of Public Works and Public Housing Agency Number 16 of 2014. [3]
C. Customer Satisfaction

Customer satisfaction is defined as the customer's response to the relevance of previous interests and perceived actual performance benefit. Customer satisfaction is determined by the various types of services that customers take when using several stages of these services [8]. Customer satisfaction is pleasure or disappointment as a result of the achievement or comparison of products, or comparisons between perceived and expected products. If the abandon performance of the customer's expectations, the customer will be disappointed; if its hopefulness, the customer will be satisfied; and if it exceeds expectations, customers will be pleased [9].

D. Customer Satisfaction Index (CSI)

The Customer Satisfaction Index (CSI) is needed to determine the overall level of respondent satisfaction regarding the level of importance of the product/service attributes [10] CSI is a number that states how big the level of consumer satisfaction will be with a particular producer.[11]

E. Methodology

The location used in the study is the Surabaya-Mojokerto Toll Road. The questionnaire was created using a google form. Questionnaires were distributed online to respondents who had used the Surabaya-Mojokerto Toll Road in the past month. The questions in the questionnaire refer to the SPM by making some adjustments. The adjustment made is to reduce the indicator questions in the SPM, for example the ambulance indicator which is difficult for toll road users to assess. The SPM indicators included in the toll road user questionnaire can be seen in the Table 2.

| No. | Indicators                                      |
|-----|------------------------------------------------|
| 9   | Crane Vehicle Handling Speed                   |
| 10  | Street sign                                    |
| 11  | Other Facilities (public street lighting, glare foe, toll road space guardrail, safety fence) |
| 12  | Accident Handling                              |
| 13  | Security and Law Enforcement                   |
| 14  | Aid/Rescue Unit and Service Assistance         |
| 15  | Information System                              |
| 16  | Environment                                    |
| 17  | Rest Area and Service Rest Area                |
| 18  | Pavement Condition on Rest Area               |
| 19  | On/off Ramp                                     |
| 20  | Toilet                                         |
| 21  | Parking Area                                    |
| 22  | Lighting                                       |
| 23  | Gas Station                                     |
| 24  | General Repair Workshop                        |
| 25  | Restaurant                                      |

The number of respondents used in this study was 120 respondents. Respondents were asked to rate the level of satisfaction and importance of each SPM indicator in the questionnaire. Parameters for assessing the level of satisfaction and level of importance can be seen in Table 3.

Table 3. Respondent Assessment Parameters

| Parameters                          | Assessment |
|-------------------------------------|------------|
| Very Satisfied / Very Important     | 4          |
| Satisfied / Important               | 3          |
| Less Satisfied / Less Important     | 2          |
| Dissatisfied / Not Important        | 1          |

The analysis used in this study is the CSI method. The stages of CSI analysis are as follows:

- Weighting Factors (WF) is a function of the Mean Importance Score (MIS-i) of each attribute in the form of percent (%) of the Total Mean Importance Score (MIS-t) for all tested attributes.
  \[ WF = \frac{MIS_i}{TotalMIS} \times 100\% \]  

- Weighted Score (WS) is a function of Mean Satisfaction (MSS) multiplied with WF.
  \[ WS = MSS \times WF \]
• Weighted Average Total (WAT) is a total of WS.
  \[ WAT = WS_1 + WS_2 + WS_3 + \ldots + WS_n \]  
  ...................... (3)

• CSI is a function of WAT divide with higher scale of questionnaire score in which use value 4.
  \[ CSI = \frac{WAT}{HS} \times 100\% \]  
  ........................... (4)

The CSI scores in this study are divided into five criteria from dissatisfied to very satisfied as shown in the Table 4.

| No. | CSI score | Criteria          |
|-----|-----------|-------------------|
| 1   | > 0.80    | Very Satisfied    |
| 2   | 0.66-0.80 | Satisfied         |
| 3   | 0.51-0.65 | Fully Satisfied   |
| 4   | 0.35-0.50 | Less Satisfied    |
| 5   | 0.00-0.34 | Dissatisfied      |

Source: Rangkuti (2016) [3]

RESULTS AND DISCUSSIONS

A. Respondents Characteristic

Characteristics of respondents contains the profile of the respondents used as object samples in this study. Total respondents on this study used 120 respondents. The respondent’s profile consists of gender, latest education, occupation, purpose of travel, and intensity of using the Surabaya-Mojokerto toll road in the past month. The characteristics of respondents shown on the Fig. 1 to Fig. 5.

Figure 1. Gender Respondents Profile

Figure 2. Respondent’s Recent Education Profile

Figure 3. Respondent’s Occupation Profile

Figure 4. Respondent’s Driving Purpose Profile

Figure 5. Intensity Profile of Respondents Using the Surabaya-Mojokerto Toll Road in the Last Month
According to the gender respondents on this study, characteristics of respondent’s results are shown that mostly the gender of driver is male with number of percentages 86%. Then from the recent education profile also shown that 48% person has graduated from bachelor degree and 36% person has graduated from high school. The highest education profile for under of high school and above bachelor degree has not significant result. From this result is it in accordance with the regulation in the minimum age allowed to get a driving license in Indonesia.

Based on the percentages of occupation respondents who are toll road users has not significant result, the variative occupation shown on the result. However, the higher percentage of toll users’ occupation are from private employees (29%). Entrepreneurs, drivers, and students rank the most users of the Surabaya-Mojokerto toll road with results that are not significantly different, namely 15% and 18%. Toll road tariffs are a factor of consideration for the community in using toll roads, especially for users who require their work mobility to require toll road facilities in their daily life. Toll road facilities for users must be in accordance with toll road tariffs, rest area facilities, driving speed, toll road quality, and the travel time factor used by toll road users.[12]

From the result, purpose of user driving also has not significantly different between work and family matters, in each percentage 43% and 48%. The toll road users also showed that they use the toll road of Surabaya-Mojokerto only 5 to 10 times a month. The intensity of toll road Surabaya-Mojokerto has significantly different with 78% between 5 to 10 times a month.

From the background profile of toll road users result, it shows that private employees are the most users of the Surabaya-Mojokerto toll road. The main reason is that the largest toll road users are family matters, where in a month toll road user do not often cross the Surabaya-Mojokerto toll road (under 10 times a month).

**B. Customer Satisfaction Index (CSI)**
The Customer Satisfaction Index is calculated using equation (1) to equation (4). The results of the CSI calculations can be seen in the Table 5.

Table 5. CSI Results Calculation

| Indicators | MIS  | MSS  | WF   | WS  |
|------------|------|------|------|-----|
| 1          | 3.76 | 2.90 | 4.33%| 0.13|
| 2          | 3.74 | 3.21 | 4.31%| 0.14|
| 3          | 3.71 | 3.22 | 4.27%| 0.14|
| 4          | 3.74 | 3.45 | 4.31%| 0.15|
| 5          | 3.66 | 3.20 | 4.22%| 0.14|

Based on the calculation results, the CSI of the Surabaya-Mojokerto Toll Road is obtained 79.56%. This value is included in the “Satisfied” service level criteria. The value of the respondents' satisfaction index means that overall, the users was satisfied with the toll road services. However, from the CSI result, the indicator with the lowest level of satisfaction is the Pavement Condition of Main Road indicator (Indicator No.1) with an MSS value of 2.90. Whereas, the indicator with the highest level of importance for toll road users is the Pavement Condition of Main Road indicator (Indicator No.1) with an MIS value of 3.76. This shows that the expectations of Surabaya-Mojokerto Toll Road users regarding the condition of the main road pavement are very high but are not matched by the quality of the main road pavement currently available. The indicator with the highest satisfaction level is the average driving speed indicator (Indicator No. 4) with an MSS value of 3.45. The importance of the average driving speed indicator with an MIS value of 3.74 indicates that the expectations of toll road users regarding travel time on the Surabaya-Mojokerto Toll Road are also very high and have been balanced with very high user satisfaction.
According to the CSI results, the priority for improving the SPM indicator on the Surabaya-Mojokerto Toll Road is the pavement condition of main road. The improvement of pavement from PT. Jasa Marga is a most important aspect that affect to the number of toll road users on the future. This aspect also can increase the number of Surabaya-Mojokerto toll users’ loyalty. The quality of toll road services affects the satisfaction of Cipali toll road users. This means that with a better quality of toll road services in this case concerning tangibility, reliability, responsiveness, and guarantees, satisfaction of Cipali Toll Road users will increase [13]. In addition, increasing in the main road pavement standard quality is expected to increase the service level criteria for the Surabaya-Mojokerto Toll Road from "Satisfied" to "Very Satisfied". Most frequent damage was potholes with mean value of 2.100.

Based on the previous study also showed that the safety indicators also become considerations for the toll road users. According to Suwarto’s study is followed by Guardrail damage and Cracking with mean value of 2,1667 and 2,233 subsequently on the toll road regarding to MSS. On the other hand, the least frequent damage in the toll road was Drainage cross section with mean value of 2.533 and rutting with mean value of 2.400. [14] This means that there are actually many aspects that must also be studied further so that the facilities provided by the toll road manager are maximized.

The CSI result also shown that the toll road condition and safety aspects is the main considerations of Surabaya-Mojokerto toll road users. Regarding the result of this study also can be informed to the management of Surabaya-Mojokerto toll road that the users has highly expectations of toll road conditions and safety. According this result study, hopefully the management can improve these aspects to increase number of users of Surabaya-Mojokerto toll road.

The existence of a balance between the services provided and user expectations cannot be achieved if it is not balanced with maintaining or even improving the service quality of other indicators. There needs to be a study that specifically discusses about the priority of service improvement so that service improvement can be maximized. The advanced study of the priority of service improvement has to investigated as sooner to reach the higher level of user satisfaction.

CONCLUSION

The criteria for the service level of the Surabaya-Mojokerto Toll Road are "Satisfied" with a CSI value of 79.56%. However, the value of the main road rigid pavement indicator because this indicator has the lowest MSS value of 2.90 but it has the highest MIS of 3.76. The important aspect of the Surabaya-Mojokerto Toll Road as a connecting road between the Surabaya and cities in the western part of East Java needs to be balanced with good service quality. So, it is very important to improve the Surabaya-Mojokerto Toll Road service to be "Very Satisfied" on the aspect improvement to main road rigid pavement. There needs to be a study that specifically discusses the priority of service improvement so that service improvement can be maximized and reach more loyalty of users.

ACKNOWLEDGEMENT

On this occasion the author would like to UPN Veteran Jawa Timur, because for the permission, the author can complete the research on time.

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