Passengers services preferences on Jakarta MRT phase I (Lebak Bulus to Hotel Indonesia)

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Abstract. MRT is one of public transportation which create reliable and affordable services to its passengers. Passengers of public transportation are the most entitled to measure the quality of service, since the transportation service provider should understand their consumer preferences. Aim of this research is to identify the Jakarta MRT passengers services preferences and what they will need in the future. Data collected using questionnaires which distributed by Google forms to passengers and analyzed by Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA). As results, the services for MRT passengers is satisfied and found some indicators which lack of performance to be improved, namely: availability of other modes service to/from stations, affordability of MRT rates and the convenience of pedestrian facilities.

1. Introduction

Transportation is a basic need for people moved to many places in the city [1]. Jakarta Metropolitan Region as the biggest urban areas in Indonesia had public transport facilities which is still not adequately fulfilling the demand of its inhabitants. Public transportation, as well as the MRT, expected to provide reliable and affordable services for all kind of passengers [2]. Although there are several modes of public transportation services in Jakarta, they are still not good enough and adequate, which can cause traffic congestion [3]. One of the objectives to operate Jakarta MRT was to reduce congestion by decreasing used of private vehicles [4]. The projections of passengers was 173,400 passengers per day in 2014, however in February 2020 the number of passengers per day only reached 89,793.

Jakarta MRT was built to answer the challenges urban public transportation due to limited space for mobility as well as providing options to make the MRT as one of the main transportation mode [4]. Service provider must understand their consumer preferences [5] and the need for ease services in accordance with the expectations of the users [6]. The concept of preference is related to the ability of users to prioritize choices in order to make decisions [7]. The demand for transportation is caused by the need for humans to travel from one to other location with such activities: shopping, working, schooling and others [8]. The perception of public transport users basically requires service performance in accordance with their expectations [8].

This study aims to identify what kind of user preferences for MRT services are seen from several aspects of services and qualities: reliability, tangible and assurance [9].

The focus of this study is the first phase of Jakarta MRT, stretches from Lebak Bulus station in South Jakarta to Hotel Indonesia in Central Jakarta which officially open in March 2019. This first phase is a part of North-South line which planned to be completed in 2027.
Lebak Bulus station surrounded by lower to upper class residential areas and also closed to the borders of city of Tangerang Selatan and Banten province, which also a source of commuter workforce to Jakarta. Hotel Indonesia located in CBD area, surrounded by high rise offices, malls, hotels, and also governmental offices. There are 13 stations with 7 elevated and 6 subway stations along 15.7 Km distance from Lebak Bulus to Hotel Indonesia.

![MRT station map](image.png)

**Figure 1.** MRT station map.

2. Research methods
The research method used in this study is Customer Satisfaction Index (CSI) [10] and Importance Performance Analysis (IPA) [11,12]. CSI used to measure the level of user satisfaction with overall service performance, while IPA used to get the level of suitability of performance against the interests of users based on their preferences per attribute.

This analysis technique was carried out after obtaining the results of the questionnaire to be filled by 100 sample passengers as calculated by the Slovin formula. Questionnaire was distributed to the MRT passengers by Google forms, since this survey was held during the Covid-19 pandemic, when workers only worked at home, and MRT services were stopped for some time.

The questionnaire consisted of a number of questions regarding variables with answer choices on a 1-5 Likert. The variables and indicators used in this research shown in the table below.
Table 1. Data requirements.

| Variables     | Indicators Code | Indicators                                                                 | Data Types |
|---------------|-----------------|-----------------------------------------------------------------------------|------------|
| Time          | 1               | Timing of arrival and departure                                              | Primer     |
|               | 2               | Travel time                                                                 | Primer     |
|               | 3               | Waiting time                                                                | Primer     |
|               | 4               | Availability of other modes of service from/to stations                     | Primer     |
|               | 5               | Ease of reaching MRT stations with other transportation                     | Primer     |
| Accessibility | 6               | Distance from origin to the station                                          | Primer     |
|               | 7               | Access to MRT stations                                                      | Primer     |
|               | 8               | Distance from MRT Station to the destination                                | Primer     |
|               | 9               | Ease of reaching the destination from the MRT Station                       | Primer     |
| Cost          | 10              | Cost affordability                                                          | Primer     |
|               | 11              | Park and ride availability                                                  | Primer     |
|               | 12              | Station Cleanliness                                                         | Primer     |
| Facility      | 13              | Availability of public facilities at the MRT Station (ATM Center, Minimarket) | Primer     |
| availability  |                 |                                                                             |            |
|               | 14              | Information boards                                                          | Primer     |
|               | 15              | Security from crime                                                         | Primer     |
| Security      | 16              | Safety of pedestrian facilities from other vehicles                        | Primer     |
|               | 17              | The convenience of pedestrian facilities                                    | Primer     |
| Amenities     | 18              | Convenience of ease when going up and down the platform                     | Primer     |
|               | 19              | The convenience of the platform waiting room facilities                     | Primer     |

3. Results and discussion

CSI method is used to measure the index customer satisfaction based on the level of importance and performance appraisal with the aim of developing influencing marketing programs user satisfaction.

First step is to measure Weighting Factor (WF), by making the average value of important preferences as the percentage of the total mean of all importance indicators, all the percentage figures are added up to get a total WF of 100%. Second step is to measure Weight Score (WS), by multiplying each indicator WF with the average of level satisfaction in each indicator. The third step to measure Weight Total (WT) by adding up the WS from all indicators, then this WT divided by the maximum scale and multiply by 100% to get Customer Satisfaction Index (CSI). The overall MRT service was stated with the CSI calculation results total 74.664778. This means that services provided by the MRT have been satisfied according to the preferences of the users.

Importance Performance Analysis (IPA) is the analysis used to find out the level of suitability for each indicator. First step is to determine the level of conformity between levels of importance and level of quality performance services, through the indicators used in this study. Second step to calculate the average on each indicator that perceived by the user. The third step is to make a Cartesian diagram which includes the level of importance and level of performance, based on the score with each indicator to be positioned on this diagram. The X axis will show the position of indicators with the total score assessment on the level of performance. The Y axis shows the position of indicator with a total score of the level of importance of the indicator.
Using IPA method this diagram divided into 4 quadrants which have different levels based on importance and performance based on user preferences. The results are as below.

![IPA Diagram](image_url)

**Figure 2.** IPA diagram.
3.1. Quadrant A
The five indicators considered important for users but not appropriate based on user preferences are: availability of other modes of service from to stations, ease of reaching the MRT Station with other modes of service, ease of reaching the MRT station from the residence, affordability of MRT fares, and convenience of pedestrian facilities. Thus, the indicators in this quadrant are the main priority for the MRT service provider to improve their service performance. Most indicators are accessibility variable and must be more focused as the main priority to be improved by local government. The tariff affordability indicator shows that the quality of service has not met the expectations of users regarding the suitability of tariffs with the services provided.

The next indicator is the convenience of pedestrian facilities which are focused on the availability of canopies or trees to protect pedestrians from both sun and rain exposure. There are indeed still a number of stations that still do not have a canopy to protect pedestrians from the sun or the absence of trees. The majority of MRT are public transportation users such as commuter line, busway, online transportation and pedestrians. Surely the importance of convenience of pedestrian facilities is very high and satisfaction is low, because there are several stations that are not ready yet.

3.2. Quadrant B
The six indicators considered important for users and their performance is considered satisfying based on user preferences are: waiting time, distance from station to destination, ease of reaching the destination from the station, availability and convenience of public facilities at stations, security from crime, safety in pedestrian facilities. The waiting time is considered important by the user, and quite satisfied since waiting time for MRT’s arrival and departure times is scheduled 10 minutes apart at normal hours and 5 minutes at peak hours. Indicators on accessibility variables such as the distance from station to the destination and the ease of reaching the destination from the station, are really important, since the majority of respondents should walk more than 1 Km to get to the destination.

Indicators of availability of public facilities is considered important and satisfying, because users also have some interests and needs to go to a minimarket, ATM, toilet and prayer room, which available on the spot. All indicators on the security indicator are in quadrant B, which means the safety variable is considered important and can provide security very well in accordance with the preferences of its users.

3.3. Quadrant C
There are two indicators (distance from residence to station and availability of a parking lot/park and ride) considered less important and not appropriate based on user preferences. Thus, the indicators in this quadrant are low priority because they have a relatively small effect on the service benefits felt by the user. Mostly user have to travel 5-10 Km to reach the station, but it was not important enough since they really want to ride this MRT, although not all stations have parks and rides or parking lots, but this is also considered less important because the majority of users use public transport to the MRT station.

3.4. Quadrant D
There are 6 indicators (punctuality of arrival and departure times, length of travel time, cleanliness of the station, availability of signboards, convenience of getting on and off the train, convenience on the platform), whose performance are considered excessive and not too important, but their performance is satisfying based on user preferences.

4. Conclusion
Based on the results of the analysis and discussion can be obtained that the overall level of user satisfaction in Jakarta MRT services and can be stated as good category. However, there are indicators need to be improved because they are considered important but their performance is still lacking. These indicators include: availability of other modes of service from/to the station, ease of reaching the station from home, affordability of the tariff, and convenience of pedestrian facilities.
It is necessary to improve indicators that are considered important but are still unsatisfying based on user preferences. Therefore the service provider should more focus on some attributes that are considered unsatisfactory based on user preferences. The accessibility and comfort of pedestrian facilities needs the availability of facilities such as canopies or trees to protect pedestrians from hot or rainy weather. Suggest for further study is needed to deeper research on MRT services that are focused on each MRT station, and also connectedness of MRT with other public transport facilities.

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