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Study on Service Quality and Priorities of Pedestrian Path Development in Malioboro Area to Support Sustainable Urban Mobility

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ABSTRACT

This article aims to study the service quality and prioritize the development of pedestrian paths in the Malioboro area to support sustainable urban mobility. Malioboro is one of the commercial and tourist centers in Yogyakarta city, historically known for its pedestrian-friendly pathways. Challenges such as pedestrian circulation issues, inadequate pedestrian facilities, conflicts between pedestrians and motorized vehicles, and problems with drop-off and stop zones for less organized transportation contribute to the low service quality in the Malioboro area. This study adopts a quantitative approach using direct observation and a questionnaire distributed to 132 pedestrian path users. The collected data is analyzed using descriptive analysis techniques and Importance Performance Analysis (IPA) to understand the existing conditions, quality, and priority of pedestrian path services in the Malioboro area. The study results indicate that the service quality of pedestrian paths in Malioboro faces several challenges. Factors such as motor vehicle traffic density, lack of quality pedestrian infrastructure, and pedestrians' unsafe behavior contribute to the low service quality. The pedestrian satisfaction analysis using the Customer Satisfaction Index (CSI) revealed a satisfaction rate of 69.19%, categorizing it as "adequate." However, improvements in pedestrian path services are necessary based on the significance of the Malioboro area and its high appeal to pedestrians. The goal is to achieve good or even perfect satisfaction in terms of service quality. An analysis of interests was conducted, resulting in the identification of four quadrants with distinct characteristics. These quadrants serve as a valuable guide for enhancing the quality of pedestrian path services. Quadrant 1 encompasses attributes such as crossing facilities, CCTV surveillance, protection from weather conditions (rain, heat, cold), and parking convenience. Despite their high importance, these variables received low satisfaction ratings from respondents. Enhancing both the quantity and quality of these variables is crucial. Policymakers should pay special attention to these four variables and implement concrete measures to surpass the "adequate" assessment and attain better pedestrian service satisfaction. By implementing these measures, it is expected that Malioboro can serve as an example in supporting sustainable urban mobility by providing good and safe services for pedestrians. This study can also provide guidance and input for the government and relevant stakeholders in decision-making regarding pedestrian path infrastructure development in similar areas.

Keywords: malioboro area; pedestrian path services; Customer Satisfaction Index (CSI); Importance Performance Analysis (IPA); pedestrian infrastructure development.

INTRODUCTION

Malioboro area is a vital region in the Special Region of Yogyakarta and is one of the development priorities in DIY (Daerah Istimewa Yogyakarta Province). The Kraton-Malioboro area and its surroundings have been designated as a tourist destination area, including cultural tourism, educational tourism, shopping tourism, village tourism, and culinary tourism (*Peraturan Daerah Daerah Istimewa Yogyakarta Nomor 5 Tahun 2019 Rencana Tata Ruang Wilayah Daerah Istimewa Yogyakarta Tahun 2019 – 2039*, n.d.). The traditional economic activities and distinctive tourism in Yogyakarta contribute to the attractiveness of the Malioboro area, inviting visitors to come.

Over time, various issues have emerged in the Malioboro area, such as traffic congestion, and poor transportation circulation, especially parking, street vendors, and pedestrians. These issues have the

potential to affect the quality of life in the Malioboro environment. The vital role of the Malioboro area demands policymakers to improve the quality of life in the area by enhancing integrated transportation systems, improving urban infrastructure quality, and regulating mobility in the Malioboro area to support various activities within it.

Based on the spatial planning guidelines (RTRW), the Malioboro area has been designated as a pedestrian area. The development of the Malioboro area will prioritize the needs of pedestrians to engage comfortably and safely in activities within the area. This is in line with the commitment to improve urban quality of life. Enhancing urban quality of life and community well-being can be achieved through sustainable mobility planning (Fernandez-Heredia & Fernandez-Sanchez, 2019).

Figure 1. Map of Study Area Boundaries

Administratively, Malioboro area is located in the urban center of Yogyakarta City, specifically in the Kapanewon Gedong Tengen, Danurejan, and Gondomanan. Regarding the research on pedestrian routes, the focus of the studied location is the main corridor of Malioboro, which includes Malioboro Pedestrian Street and Margo Mulyo. The selection of this study location is motivated by the fact that Malioboro area is a tourist attraction in Yogyakarta City, which naturally attracts tourists and also plays a vital role in urban areas, both in terms of economic activities and governance. However, there are still many issues in providing urban facilities in this area, such as:

1. Regulation of pedestrian circulation
2. Provision of complete pedestrian facilities
3. Frequent conflicts between pedestrians and motor vehicle drivers
4. Issues with drop-off areas and stop zones for transportation modes that lack order and precision

RESEARCH METHODS
Materials

The study involved gathering various data inputs to analyze the pedestrian paths. These inputs encompassed the initial identification of environmental characteristics, pedestrian characteristics, and pedestrian activity characteristics. Descriptive analysis and specialized behavior mapping techniques were employed to analyze these three types of data.

Pedestrian environment is a term that includes a set of several factors forming a pedestrian environment. These factors include road design, building layout, land use, and road network design which certainly affect the pedestrian environment which must be planned and managed to ensure proper design and sustainable infrastructure accessibility (The International Bank for Reconstruction and Development / The World Bank, 2018).

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Pedestrians refer to individuals who engage in the act of walking or utilize non-motorized means or
assistive devices, such as wheeled tools, during their movement. Each pedestrian possesses their
own unique activity patterns and characteristics when it comes to the act of walking a(NZ Transport
Agency, 2009). Factors such as type of facility, location, width, gender and age were observed to
have the most significant impact on pedestrian characteristics (Banerjee et al., 2018).

The pattern of spatial movement is a concept with the characteristics of spatial movement that
movement arises based on existing land use in an area (Tamin, 2000). Pedestrian Experience refers
to a mental process that impacts how pedestrians behave when they interact with pedestrian paths
and the surrounding environment (Jeong et al., 2018). Pedestrian Experience refers to a mental
process that impacts how pedestrians behave when they interact with pedestrian paths and the
surrounding environment (Bezbradica & Ruskin, 2019).

Additionally, an assessment of satisfaction and interest was conducted, utilizing the Customer
Satisfaction Index (CSI) to evaluate pedestrian satisfaction and the Importance Performance
Analysis (IPA) to gauge pedestrian interests. The analysis results were then processed and integrated
to generate outputs such as user satisfaction with pedestrian path services and the importance level
of pedestrian paths. **Figure 2** below is a flow chart of the analysis carried out in this study.
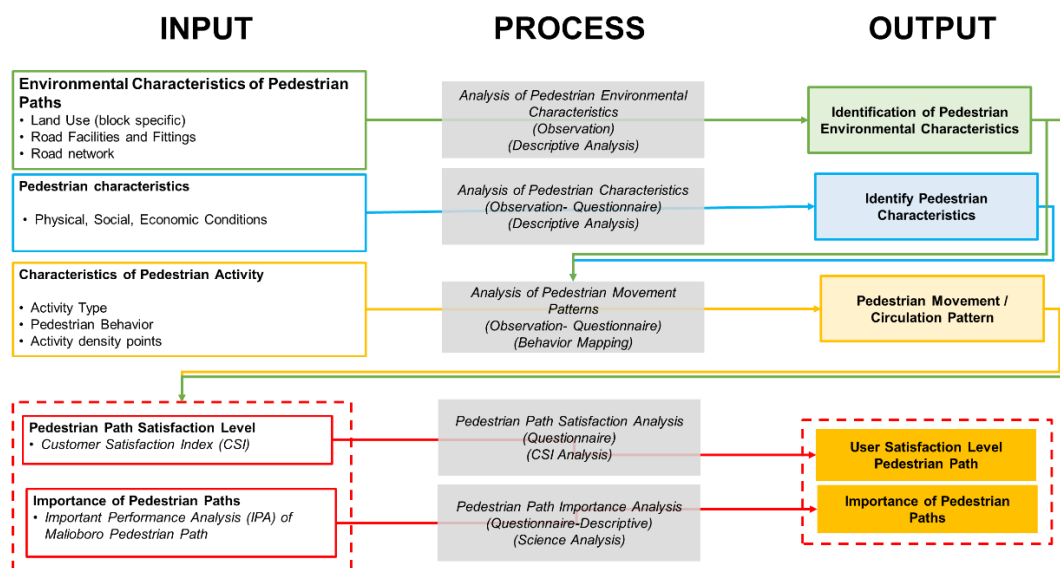

Figure 2. Analysis Flow

Methods

The method used in this research is quantitative methods. Quantitative research is a means to test
objective theories that examine the relationships between measurable variables, which can be
analyzed using statistical procedures (Creswell, 2009b, 2009a). During data collection from the
perspective of the community or pedestrians in the Malioboro area, a questionnaire method was used
to assess the satisfaction level towards the research object using a Likert scale.

The questionnaire method was conducted by providing a list of questions related to the respondents'
perceptions of road needs. The questionnaire in this study was distributed to several research
respondents, including local residents and tourists in the Malioboro area. In this study, since the
population size in the Malioboro area is unlimited, a sample size of at least 100 people was taken to
represent the entire population in the Malioboro area (Sugiyono, 2008). The actual number of
respondents in the field survey was 132 people.

After the field survey was conducted, the respondent data was processed using Importance-
Performance Analysis (IPA). Importance-performance analysis (IPA) is a way to analyze customer
satisfaction with an object based on the assessment of the importance and performance levels of
each attribute (Abalo et al., 2007). The result of this analysis provides a formulation that represents

the satisfaction and importance values of each variable related to pedestrian service in the Malioboro area.

Data Analysis

The data used was collected through 2 methods, namely observation and questionnaire. The observation method was conducted to directly observe an object as data or information needed for the research. In this case, field observations were conducted on the condition of the road, activities, and road users in the Malioboro area, including descriptions and documentary photos. Additionally, Behavior Mapping was also used to map the movement patterns of road users in the Malioboro area (Agustapraja, 2018).

Meanwhile, the questionnaire method was carried out by providing a list of questions regarding the respondents' perceptions of road needs. The questionnaire in this research was distributed to several research respondents, including residents and tourists in the Malioboro area.

RESULT AND DISCUSSION

Customer Satisfaction Index (CSI) Service Quality for the Malioboro Pedestrian Route for the Realization of Sustainable Mobility

The level of satisfaction of users of the Malioboro Pedestrian Route in this study was carried out through an analysis of the calculation of the Customer Satisfaction Index (CSI). **Table I** below is the result of CSI calculations based on field survey data that has been carried out:

Table 1. Calculation results of the Customer Satisfaction Index

No	Pedestrian Line Service Attributes	X-Satisfaction	Y-Importance	X x Y
	Safety Aspect (S)			**44.650**
S1	Avoid conflicts with vehicles	2.674	3.508	9.380
S2	Adequate crossing facilities	2.515	3.508	8.822
S3	Supporting facilities such as Signs, Markings, Lights, Fences, APAR	2.659	3.485	9.267
S4	Safety Assembly Point	2.705	3.333	9.015
S5	Vehicle Speed Settings	2.318	3.523	8.166
	Security Aspect (A)			**38.576**
A1	There is a Security Officer / Patrol	2.652	3.508	9.300
A2	Complaint Facilities and Procedure Clarity	2.462	3.424	8.431
A3	Surveillance camera/CCTV facilities	2.689	3.530	9.494
A4	Lighting Facilities at Night	3.121	3.636	11.350
	Comfort Aspect (Y)			**51.173**
Y1	Facility Sloping Stairs	2.977	3.402	10.127
Y2	Protects from Weather Problems (Rain, Heat, Cold)	2.508	3.530	8.853
Y3	The road is smooth, not potholes and not slippery	2.947	3.568	10.515
Y4	Environmental Cleanliness	2.871	3.614	10.376
Y5	The Beauty of Regional Display	3.174	3.561	11.302
	Accessibility / Convenience Aspect (M)			**40.587**
M1	Information Board Facility	2.894	3.508	10.151
M2	Ease of doing Parking	2.553	3.553	9.071
M3	Ease of finding the intended location	3.015	3.530	10.644

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No	Pedestrian Line Service Attributes	X-Satisfaction	Y-Importance	X x Y
M4	Ease of reaching Bus Stops/Points of Other Transportation Stops	3.030	3.538	10.721
	Total Value		63.258	174.985

$$\text{CSI} = \frac{174.985}{4(63.258)} \times 100\% = \frac{174.985}{253.030} \times 100\% = 69.16\%$$

Referring to **Table I** and the previous calculation of the Customer Satisfaction Index (CSI), it can be determined that the assessment of pedestrian satisfaction yielded a score of 69.16%. This score falls within the **"Enough"** category, indicating a satisfactory level of pedestrian satisfaction (Dewi, 2017).

Important Performance Analysis (IPA) Quality of Service for the Malioboro Pedestrian Route for the Realization of Sustainable Mobility

Table 2. Important-Performance Analysis of Pedestrian Line Services

No	Pedestrian Line Service Attributes	Satisfaction	Importance
	Safety Aspect (S)	**2.574**	**3.471**
S1	Avoid conflicts with vehicles	3.508	3.508
S2	Adequate crossing facilities	3.508	3.508
S3	Supporting facilities such as Signs, Markings, Lights, Fences, APAR	3.485	3.485
S4	Safety Assembly Point	3.333	3.333
S5	Vehicle Speed Settings	3.523	3.523
	Security Aspect (A)	**2.731**	**3.525**
A1	There is a Security Officer / Patrol	3.508	3.508
A2	Complaint Facilities and Procedure Clarity	3.424	3.424
A3	Surveillance camera/CCTV facilities	3.530	3.530
A4	Lighting Facilities at Night	3.636	3.636
	Comfort Aspect (Y)	**2.895**	**3.535**
Y1	Facility Sloping Stairs	3.402	3.402
Y2	Protects from Weather Problems (Rain, Heat, Cold)	3.530	3.530
Y3	The road is smooth, not potholes and not slippery	3.568	3.568
Y4	Environmental Cleanliness	3.614	3.614
Y5	The Beauty of Regional Display	3.561	3.561
	Accessibility / Convenience Aspect (M)	**2.873**	**3.532**
M1	Information Board Facility	3.508	3.508
M2	Ease of doing Parking	3.553	3.553
M3	Ease of finding the intended location	3.530	3.530
M4	Ease of reaching Bus Stops/Points of Other Transportation Stops	3.538	3.538
	Total Value	2.765	3.514

Based on the table above, it can be identified that the obtained assessment results are 2.765 for Satisfaction and 3.514 for Importance. These average numbers influence the position of the separating lines, namely X (Satisfaction) and Y (Importance), which divide the attributes in the matrix. Furthermore, the average assessment data for each attribute between satisfaction and

importance is processed into an IPA Matrix using the SPSS application, with the processed results shown in **Figure 3**.
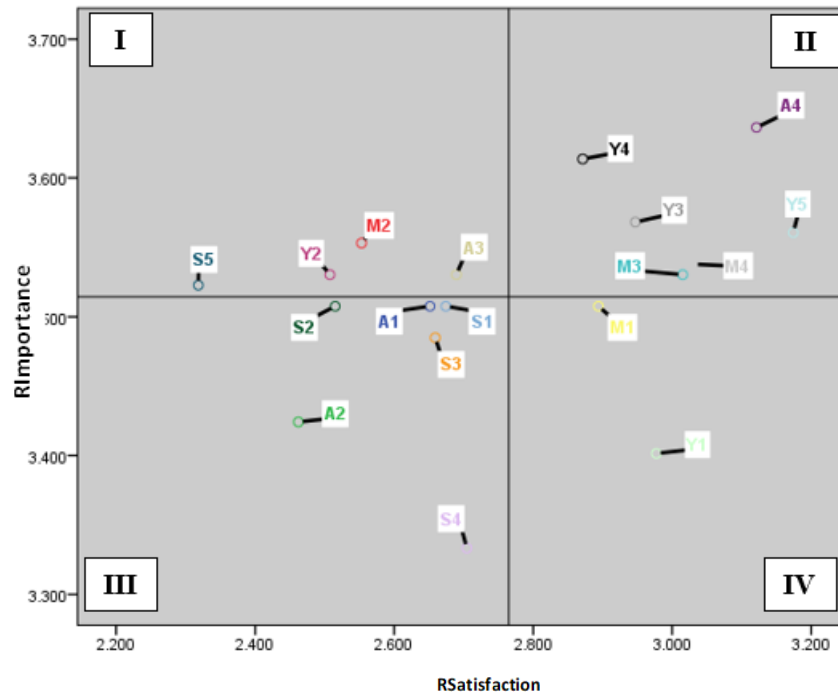

Figure 3. IPA Matrix Field Survey Results

The analysis results using IPA displayed in the matrix above produce the following distribution (Padlee et al., 2020):

Quadrant I - High Importance, Low Satisfaction

Quadrant I means that the attributes have high urgency or importance to be available in the pedestrian pathway service, but in reality, users feel unsatisfied with the existing service. The variables included in Quadrant I should be the primary concern for policymakers to achieve better pedestrian pathway services for users. The analysis results identify the variables that fall into Quadrant I, namely:

1. S5 Vehicle Speed Control
2. Y2 Protection from Weather Conditions (Rain, Heat, Cold)
3. M2 Ease of Parking
4. A3 Surveillance Camera/CCTV Facilities

Quadrant II - High Importance, High Satisfaction

Quadrant II means that the attributes have a high importance value to be available in the pedestrian pathway, and in their implementation, these attributes are already considered highly satisfying for users. The attributes included in Quadrant II should be maintained and even improved to provide better services. The analysis results identify the variables that fall into Quadrant II, namely:

1. Y3 Smooth Road Surface, No Potholes, Non-slippery
2. Y4 Environmental Cleanliness
3. Y5 Aesthetic Appeal of the Area
4. M3 Ease of Finding the Intended Location
5. M4 Ease of Reaching Bus Stops/Other Transportation Points
6. A4 Night Lighting Facilities

Quadrant III - Low Importance, Low Satisfaction

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Quadrant III means that the attributes are rated low by users and, on the other hand, their provision is not considered highly important. The attributes in Quadrant III are considered to have a low impact. However, in reality, the provision of these attributes is also important to deliver a more complete and improved service to road users. The analysis results identify the variables that fall into Quadrant III, namely:

1. S1 Avoidance of Conflicts with Vehicles
2. S2 Adequate Crosswalk Facilities
3. S3 Supporting Facilities such as Signs, Road Markings, Lights, Fences, Fire Extinguishers
4. S4 Safety Gathering Points
5. A1 Presence of Security Officers/Patrols
6. A2 Complaint Facilities and Clarity of Procedures

Quadrant IV - Low Importance, High Satisfaction

Quadrant IV means that the attributes receive high satisfaction ratings from road users, but they have low urgency or importance in pedestrian pathway services. The provision of attributes in Quadrant IV is not a top priority, so their priority scale should be considered to avoid wastage. The analysis results identify the variables that fall into Quadrant IV, namely:

1. M1 Information Board Facilities
2. Y1 Gradual Staircase Facilities

CONCLUSION

Improving the quality of pedestrian services is an important investment in creating a safe, comfortable, and sustainable city. Safety, security, comfort and accessibility in good pedestrian services will bring significant benefits to the community. In working toward a more sustainable future, governments and stakeholders need to work together to improve pedestrian services and create more humane and pedestrian-friendly cities. The results of satisfaction of 69.19% or the "adequate" category obtained from the analysis using CSI as a representation of pedestrian satisfaction with pedestrian path services certainly require improvement in their services. Considering that the Malioboro area is a vital area with high attractiveness for pedestrians, good and even perfect satisfaction is expected in terms of service. Then an analysis of interests was carried out and produced 4 quadrants with their respective characteristics which would certainly be one of the steps that can be considered in improving the quality of pedestrian path services. Attributes included in quadrant 1, which include adequate crossing facilities, CCTV surveillance facilities, protection from weather conditions (rain, heat, cold), and ease of parking are variables that receive low satisfaction ratings from respondents, while these variables have a high level of importance and should be improved in terms of both quantity and quality. Special attention and concrete steps taken by policymakers towards these four variables are very important to achieve satisfaction with pedestrian services which is better than the "adequate" assessment.

ACKNOWLEDGEMENT

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