ANALYSIS OF COMMUNITY SATISFACTION WITH THE USE OF ELECTRIC MOTORBIKES IN THE CITY OF SOUTH SURABAYA

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ABSTRACT

The development of modern transportation can be viewed from several aspects, such as quality, effectiveness and efficiency for its users, especially the millennial generation. One of the modern transportation today is an electric motorcycle. The development of electric motorcycles in Indonesia is not as fast as the development of conventional motorcycles. Electric motorcycles that are currently developing need to be analyzed to determine the level of consumer satisfaction. Analysis of the level of customer satisfaction can be done using the method. By knowing the analysis of the Kano method, improvements or evaluations can be made for developers of relevant electric motors in the future. Test analysis was carried out by conducting a survey of electric motorcycle users in the Surabaya area. Based on the analysis of the results of Kano's research that has been done, it can be seen that there is a need for an increase in electric motorbikes. This shows that with an increase in electric motorbikes, people's satisfaction with the use of electric motorbikes will increase.

Keywords : Electric Motorbikes, Community Satisfaction, Product Quality, The Canoe Method

Introduction

Mode of transportation is one of the basic human needs in carrying out an activity that involves mobility by land, sea or air [1]–[3]. Transportation modes can be grouped into two types, namely public transportation modes and private transportation modes. Private mode of transportation is a mode of transportation that is personally owned or completely accompanied by documents stating official proof of vehicle ownership. In today's modern era, people's mobility is influenced by modes of transportation that continue to develop to increase the efficiency of travel time and save costs. The development of current modes of transportation is influenced by the increasingly rapid development of science and technology. Various parts of the world today tend to prioritize the development of efficient, environmentally friendly and innovative modes of transportation. This development spread to the homeland which also developed similar modes of transportation for the sake of the implementation of a thriving life. The community expects transportation that is efficient, practical, also relatively affordable in terms of price and quality, especially in big cities [4]–[6].

Electric motorbikes are a mode of transportation that is starting to spread to every element of society, especially students. The integration of electric motorbikes is an idea to reduce the level of carbon emissions and environmental pollution. The use of electric motorbikes as a mode of transportation can be an alternative because they are relatively environmentally friendly, tend to be more affordable, but are still limited in terms of power durability. This certainly supports and supports the community's expectations regarding developing modes of transportation, especially in big cities. Surabaya City is one of the big cities in Indonesia that supports the integration of sustainable modes of transportation. In relation to electric motorbikes, the City of Surabaya has made efforts to provide Electric Fuel Filling Stations (SPBBL) at certain points, especially in the South Surabaya city area to support the integration of electric motorbikes. The Surabaya City Government's efforts also support electric motorbike developers to improve the development of the quality of electric motorbikes as a transportation innovation in the future [7]–[10].

The success index of the idea of integrating motorcycle transportation services can be viewed from many contexts, one of which is the quality of use, effectiveness and efficiency. In the analysis with electric motorbikes, the success of the idea of integrating services can be seen from the available context. Quality is also one of the important points of a product in supporting success because it can be related to user feedback in the form of positive and negative. The effectiveness of transportation is assessed from the aspect of reducing natural resources, environmental pollution, and the credibility of transportation for the massive movement of people. Customer behavior states that customer satisfaction is the perspective of consumer experience after consuming or using a product or service [11], [12]. The more users of electric motors, the more complex the problems they face. In addition, at the same time, the community also has high expectations for an effective and efficient mode of electric motorbike transportation which will have an impact on people's satisfaction in using electric motorbikes as a mode of transportation. Analysis in determining community satisfaction can use the Kano method. The Kano method is a method that aims to categorize the attributes contained in a product to measure how good the product or service

is. There is previous research discussing the satisfaction and quality of electric motorbikes. This research produced an indicator that people's satisfaction with electric motorbikes was influenced by the reliability of electric motor bikes. Based on previous research, there has been no research on public satisfaction with the electric motorcycle mode of transportation using the Kano method. This research will identify the factors that influence people's satisfaction with the use of electric motorbikes in the city of South Surabaya. The choice of the South Surabaya City area as the object of observation was due to the integration of Electric Motorcycles transportation modes which had begun to be intensified in the South Surabaya City area. The results of this identification can be used as material for evaluating product quality in increasing customer satisfaction [13]–[15].

Kano method was developed by Noriaki Kano [16]–[18]. The Kano method is a method that aims to classify the attributes derived from products and services based on the good or bad quality of the product or service being able to satisfy customer needs. Service attributes can be divided into several categories. In the must be or basic needs category, consumers become dissatisfied if the performance of the attribute concerned is low. However, customer satisfaction will not increase rapidly above neutral even though the performance or value of the attribute is high. In the one-dimensional or performance needs category, the level of customer satisfaction is linearly related to the performance of attributes, so that relatively high attribute performance will result in high customer interest and satisfaction [19]–[21]. Whereas in the attractive or excitement needs category, the level of customer satisfaction will increase very rapidly with the increase in attribute performance. However, a decrease in attribute performance will not result in a decrease in the level of satisfaction [22]–[25].

Ignorance of service attribute categories can result in negative consequences for electric motorcycle users. If the product or service provider does not realize that the desires of consumers are different. This customer category is noteworthy because it will not be fixed over time. The customer category will change accordingly time development. Specifically, the attractive attribute will be one dimensional, and finally it will be a must be attribute.

Research Methods

This study uses two types of data, namely secondary data and primary data. Secondary data comes from literature studies to determine attributes on Garvin's dimensions. The primary data comes from filling out the questionnaire. The questionnaire contains attributes that are adjusted to people's satisfaction with the use of electric motorbikes by referring to Garvin's dimensions. The total attributes used are 4 attributes, with an assessment based on respondents' expectations and respondents' perceptions.

The measurement scale used for this study is the Likert measurement scale starting from the numbers 1 to 5. The Likert scale is able to measure attitudes, opinions and perceptions of a person or group about events or social phenomena. After the data is filled in by the respondents, then the data is tested for validity and reliability to ensure that the data collected is suitable for use and the application of the Kano method. The Kano model was developed by Prof. Noriaki Kano is a model that aims to categorize the attributes of a product or service based on how well the product or service is able to satisfy user needs. In this model, Kano distinguishes three types of desired products that can affect consumer satisfaction, namely:

1. Category Must-be requirements (basic attributes)
   If this category is not met, the consumer will be extremely dissatisfied. On the other hand, because consumers consider this category appropriate, fulfillment of this category will not increase consumer satisfaction.
2. One-dimensional requirements category (expected attribute)
   In this category, consumer satisfaction is proportional to attribute performance. The higher the attribute performance, the higher the consumer satisfaction.
3. Attractive requirements (attributes that can increase customer satisfaction)
   The determination of these categories will have an impact on increasing customer satisfaction which is very high, but if it is not fulfilled it will not cause a decrease in the level of satisfaction.

There are two kinds of questions in the questionnaire, namely functional questions and dysfunctional questions. Example:

1. Functional question: "Electric motor engine quality (electric motor lasts up to 8 hours of use)".
2. Dysfunctional question: "The quality of the electric motor engine (electric motors do not last up to 8 hours of use)".

The two questions can then be classified into six categories, namely: A = Attractive, M = Must-be, O = One-dimensional, I = Indifferent, R = Reverse, and Q = Questionable. By combining functional and dysfunctional questions, the types of product requirements can be classified.

After combining the respondents' answers on the functional and dysfunctional questions, the results of Kano's evaluation are listed in the results table which shows the overall distribution of the customer requirements categories. The process can be seen in Figure 1 below.
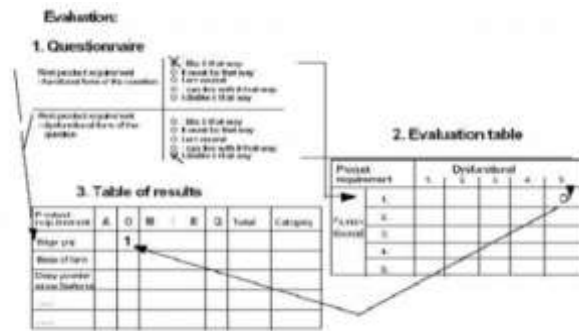
Fig. 1. Kano's evaluation process

Determination of the Kano category for each attribute using Blauth's formula according to Mustakim (2017), among others:

a. If (one-dimensional + attractive + must-be) > (indifferent + reverse + questionable) then the grade is obtained from the maximum of (one-dimensional, attractive, must-be)

b. If (one-dimensional + attractive + must-be) < (indifferent + reverse + questionable) then the grade is obtained from the maximum of (indifferent + reverse + questionable)

c. If the total value (one-dimensional + attractive + must-be) = (indifferent + reverse + questionable) then the grade obtained is the maximum among all kano categories, namely (one-dimensional, attractive, must-be, indifferent, reverse, questionable).

Results and Discussions

A. Data Collection

The questionnaire filled out by the respondents consisted of 22 questions. Respondents who fill out the questionnaire must have criteria, namely the general public in the city of Surabaya who come from various universities who are domiciled in the South Surabaya area and have an electric motorbike mode of transportation. Data that was successfully collected as many as 60 respondents. The contents of the questionnaire questions are in Table 1.

Table 1. Attributes of student satisfaction to electric motors

	Attribute
X1	The fuel consumption of electric motorbikes is more efficient than petrol motorbikes
X2	The torque (pull) of an electric engine is lower than the torque (pull) of a gasoline engine
X3	The frequency (sound) of electric motors tends to be smoother than gasoline motors
X4	Durable spare parts for electric motorcycles
X5	The size of the electric motor is slimmer than the petrol motor
X6	Charging the electric motor battery takes a long time
X7	The electric motor is durable in rainy weather conditions
X8	The durability of an electric motorbike engine is better than a gasoline motorbike when it travels 15 km or more
X9	The durability of an electric motorbike engine when going uphill is better than a gasoline motorbike
X10	The performance of electric motors is better than gasoline motors
X11	Electric motorbikes can be a sustainable mode of transportation in the future

Before the questionnaire data is processed further, it is necessary to test the validity and reliability of the questionnaire. The processing results of the validity test show that the significance value of each question is less than 5%, which means that all data is valid. The results of the validity test are presented in Table 3.

Table 2. Validity test results

Attribute	Significance Value	Information
X1	0.46362	Valid
X2	0.67833	Valid
X3	0.70452	Valid
X4	0.65138	Valid
X5	0.58512	Valid
X6	0.70024	Valid

X7	0.43973	Valid
X8	0.50921	Valid
X9	0.72478	Valid
X10	0.5297	Valid
X11	0.89711	Valid

B. Measurement of people's satisfaction with the use of electric motorbikes

The output value of the reliability test produces a Cronbach's Alpha value of 0.70874. Furthermore, this value is compared with the r table when the N value is 60 and the significance is 5%, that is, the r table is 0.2108. The comparison shows that the data is declared reliable because the Cronbach's Alpha result is 0.70874 which is greater than the r table result which is 0.2108.

After testing the reliability and validity, then the questionnaire data were analyzed using the Kano method. The results of Kano's categorization of each attribute using Blauth's formula are presented in Table 3.

Table 3.Kano method integration

Attribute	Attribute						*Better*	*Worse*	Total	*Grade*
	A	M	O	R	Q	I				
X1	2	8	4	0	0	46	62	66	60	*Indifferent*
X2	5	8	1	2	1	43	57.2	54.6	60	*Indifferent*
X3	8	13	0	9	1	29	50	43,625	60	*Indifferent*
X4	0	4	3	0	1	52	0.050847458	3.06779661	60	*Indifferent*
X5	29	4	0	19	0	8	41	12.13793103	60	*Attractive*
X6	2	37	2	4	2	13	55	72.5	60	*Must be*
X7	0	1	5	0	0	54	0.083333333	5.016666667	60	*Indifferent*
X8	0	21	3	1	2	33	0.052631579	3.368421053	60	*Indifferent*
X9	0	19	7	0	1	33	0.118644068	7.322033898	60	*Indifferent*
X10	4	5	0	1	0	50	59	56.25	60	*Indifferent*
X11	23	13	0	9	0	15	51	28.56521739	60	*Attractive*

Table 3 shows that the attributes of people's satisfaction with electric motorbikes in the City of South Surabaya fall into several categories, namely indifferent, attractive, and must-be. In the indifferent category there are several attributes, namely regarding the performance of the motor in terms of electric fuel consumption, torque or pull of the electric motor, and the frequency of the sound of the electric motorbike engine, the characteristics of the motor in terms of the durability of the electric motor spare parts, the resistance of the electric motor in certain weather conditions, the durability of the motor electricity in traveling a certain distance, the resistance of the electric motor in going uphill, as well as a comparison of the performance between electric motors and gasoline motors. This means that the presence or absence of these things does not affect consumer decisions and does not make a significant difference in satisfaction reactions to electric motorbikes. Then in the attractive category there are several attributes, namely regarding the comparison of the size of electric motorbikes to gasoline motorbikes and perceptions about electric motorbikes being a sustainable mode of transportation in the future. This means that the absence of this attribute does not cause dissatisfaction because it is not expected by the user. However, the achievement of this attribute will increase performance customer satisfaction in line with the increase in satisfaction reaction attributes towards electric motors. Then in the must-be category, there are attributes regarding the duration of charging the electric motor.

Conclusion

The output value of the reliability test produces a Cronbach's Alpha value of 0.70874. Furthermore, this value is compared with the r table when the N value is 60 and the significance is 5%, that is, the r table is 0.2108. The comparison shows that the data is declared reliable because the Cronbach's Alpha result is 0.70874 which is greater than the r table result which is 0.2108.Based on the analysis of Kano's research results that have been carried out, there are 8 attributes included in the indifferent category, 2 attributes included in the attractive category, and 1 attribute included in the must-be category. In the indifferent category, namely regarding the performance of the motor in terms of electric fuel consumption, torque or pull of the electric motor, and the frequency of the sound of the electric motorbike engine, the characteristics of the motor in terms of the durability of the electric motor spare parts, the resistance of the electric motor in certain weather conditions, the resistance of the electric motor in traveling a certain distance, the resistance of the electric motor in going up hills, as well as the performance comparison between electric motors and gasoline motors need further improvement in order to increase value in customer satisfaction. In the attractive category there are several attributes, namely regarding the

comparison of the size of electric motorbikes to gasoline motorbikes and perceptions about electric motorbikes being a sustainable mode of transportation in the future that can be developed to support an increase in user satisfaction reactions to electric motorbikes. Whereas in the must-be category, there are attributes regarding the duration of charging the electric motor that must be met as a basic requirement in determining user satisfaction with electric motors.

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