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Analysis of Service Quality on Customer Satisfaction Through Importance Performance Analysis and KANO Model

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ABSTRACT

Customer satisfaction is the level at which the perceived performance of the product will match the expectations of a customer. PT. Astra International Tbk-Daihatsu is a company that runs in the automotive field This study was conducted in the workshop division because it has a very high target in the customer satisfaction index which is 93. In addition, the failure of reaching the customer satisfaction index target in March represents the gap between customers and the company's service. Also, the employees in the workshop service and spare parts get a warning in the form of a warning letter and income reduction in that period. The purpose of this research is to know the service attributes that need to be improved based on the integration of the Importance Performance Analysis (IPA) method and the KANO model. The results of this study show that in the IPA model there are 2 quadrants containing attributes that must be improved. Quadrant I is the main priority consisting of attribute 1, attribute 5, attribute 9, and attribute 11. On the other hand, the KANO model results in 3 attribute categories namely attractive consisting of attribute 1, attribute 2, attribute 7, attribute 9, then one dimensional consisting of attribute 3, attribute 4, attribute 5, attribute 6, attribute 8, attribute 10, attribute 11, attribute 12, attribute 14, attribute 15, attribute 16, attribute 17, attribute 18, attribute 19, attribute 20, and the last must be consisting of attribute 13. Furthermore, integration between the IPA and KANO models is carried out to produce service priorities that must be improved. From the results of the integration, it is found that the service attributes that are the priority for improvement are attribute 1, attribute 5, attribute 9, attribute 11, attribute 7, attribute 3 and attribute 14.

1. INTRODUCTION

According to Kotler [1] "Customer satisfaction is the level where perceived performance the product will be in line with the expectations of a customer". If product performance is much lower than customer expectations, the buyer is not satisfied. Conversely, if performance is in line with expectations or exceeds expectations, the buyer is satisfied or feel very happy [2].

This research was conducted at PT. Astra International Tbk-Daihatsu. PT Astra International Tbk - Daihatsu is a Daihatsu Holder Agent in Indonesia, which is a brand in the global automotive industry. PT Astra International Tbk-Daihatsu Branch Office Serang City has two main divisions namely sales division and workshops and spare parts division. Both divisions are reviewed every month by Astra International Center, an assessment of Customer Satisfaction Index (CSI) results from customers directly surveyed randomly by Astra International Center. Both divisions are given the target by Astra International Center of 90 CSI values for the sales division and 95 CSI values for the workshop and spare parts division. This research focuses on service quality of workshops and spare parts division PT. Astra International Tbk-Daihatsu Branch Office Serang City because the parts of the workshop and spare division are the biggest part of its CSI assessment index by Astra

International Center. The selection of workshops and spare parts division as the focus of research that is due to the lack of target achievement of Astra International Center, which is in March 2017 where from 5 customers surveyed there are 3 customers who express their dissatisfaction with the service of the workshop and spare parts division. This affects the gap between the customer and the service company, and also the existing employees in the services of workshop and spare parts division received a warning in the form of warning letters and income reduction in that period. This shows that Astra International has a very high standard for customer satisfaction, the company assumes that the customer is an asset that must be maintained and served maximally.

Based on the problems that occurred in the company especially in the workshop and spare parts division, the researcher will focus on the service quality of parts of the workshop and spare parts division. The researcher uses the concept of Importance Performance Analysis (IPA) and KANO Model to get a solution from the problem. Importance Performance Analysis (IPA) contains how to translate what consumers want to be measured in terms of what the company should do to produce quality products, both tangible and intangible, while the KANO model aims to categorize the attributes of a product or service, Categorization of attributes based on how well the product or service is able to satisfy the needs of consumers [3]. In other words, Importance Performance Analysis (IPA) focuses on customer interests on company performance [6] and KANO Model focuses on the functions of the service attribute [7]. Then, the integration of both methods is done. Integration between the Importance Performance Analysis (IPA) model - KANO is used as a tool to classify and diagnose service quality attributes and provide specific strategies for attributes within each category. Integration of the Importance Performance Analysis (IPA) model -KANO can avoid the limitations of the KANO model that ignore attribute performance and importance, but also eliminate the weakness of the IPA model that only consider one-dimensional quality [4].

The aim of this research is to know the service attributes that need to be improved based on the integration of Importance Performance Analysis (IPA) method and KANO model. Another purpose is to give improvement advice using tools 5W + 1H.

2. RESEARCH METHOD

2.1 Research Design

The purpose of this study is to determine how the quality of service and what services should be a top priority for repaired service workshop at PT. Astra International Tbk-Daihatsu Branch Office Serang City, Banten. To improve customer satisfaction through IPA (Importance Performance Analysis) and Kano Model, the research design is composed of the variable (X) and variable (Y). Variable (X) is the quality of services consisting of physical evidence (Tangibles), empathy (Empathy), reliability (Reliability), Responsiveness (Responsiveness) and certainty (Assurance). Variable (Y) is the customer satisfaction.

The analysis begins with a questionnaire distributed to the customer, each question item has two answers on a Likert scale, ie whether customers think it is important to do and how it performs, whether or not good. Furthermore, the level of these elements will be elaborated in the Cartesian diagram of Importance Performance Analysis [3]

Both variables will go through the data process to be organized into a form that is easier to read and interpret. Relationships among variables identified as influence relationships are independent variables affect the dependent variables that will be tested through the method of IPA and KANO [4].

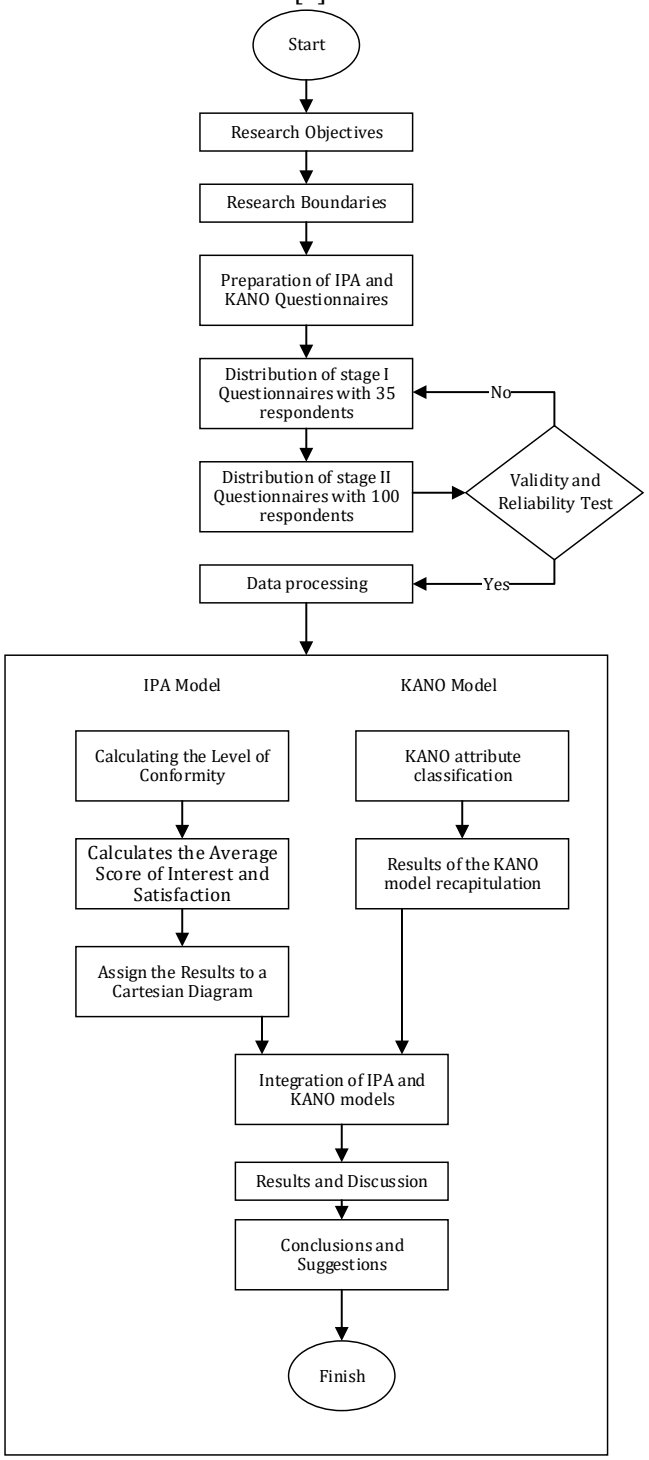

Figure 1. Research methodology flowchart

By filling out the assessment result of the level of importance and level of satisfaction, the correlation between them will be seen. This level of correlation means the result of comparison between the satisfaction score and the interest score. This level of correlation will determine the order of priority of increasing factors that affect customer satisfaction. This research consists of two variables represented by the letter X and Y, where X is the level of satisfaction/performance of the company that can provide satisfaction for customers, while Y is the level of customer interest.

The Kano Model was first raised by Noriaki KANO at the University of Tokyo Rika with the aim of categorizing the attributes of a product or service. In Kano Model, categorizing attributes is done based on how well the product or service is able to satisfy the needs of the consumer. Kano Model is divided into three types of product needs that affect customer satisfaction [3] namely:

Attractive or Excitement needs or delighters (A)

The level of customer satisfaction will increase very high with increasing attribute performance. However, a decrease in attribute performance will not cause a decrease in satisfaction levels.

One dimensional or performance needs or linear (O)

The level of customer satisfaction relate linearly with attribute performance, so high attribute performance will result in high customer satisfaction as well.

Must-be or Basic needs or Threshold (M)

The customer is not satisfied if the performance of the attribute is low. But customer satisfaction will not rise far above neutral even though the performance of these attributes is high.

Indifferent (I)

If the level of customer satisfaction does not affect the attribute performance results.

Questionable Result (Q)

If the level of customer satisfaction cannot be defined (there is a contradiction in the customer's answer).

Reverse (R)

If the level of customer satisfaction is inversely proportional to the attribute performance results.

Consumer needs based on the above three types (one-dimensional, must-be, and attractive) can be classified in the form of questionnaires. There are two kinds of questions in the questionnaire, they are functional questions and dysfunctional questions. These two questions can then be classified into six categories:

A = *Attractive* (Interesting)
M = *Must-be* (Required)
I = *Indifferent* (Neutral)
O = *One Dimensional* (Linear)
R = *Reverse* (Setback)
Q = *Questionable* (Doubtful)

By combining functional and dysfunctional questions, the type of requirements for a product can be classified as shown in Table 1.

Table 1. KANO Evaluation Table

Customer Requirement		Dysfunctional Question				
		1	2	3	4	5
		Like	Must-be	Neutral	Live with	Dislike
Functional Question	Like	Q	A	A	A	O
	Must-be	R	I	I	I	M
	Neutral	R	I	I	I	M
	Live with	R	I	I	I	M
	Dislike	R	R	R	R	Q

After the response of each respondent categorized into A, O, M, I, R or Q, then the number of each category on each service attribute is calculated. And the KANO category for each attribute is determined by the following rules: If (O + A + M)> (I + R), then the service attribute category is max (O, A, M); else, the KANO category for the service attribute is max (I, R).

Usually, Kano Model consists of 3 categories, but consumer response always consists of indifferent, questionable, and reverse categories. *Indifferent* is a category where if there is any service will not affect consumer satisfaction. *Reverse* is a category where the degree of customer satisfaction is higher if the service doesn't go as it should be than satisfied with the services that run better. It can be said that the determination of the company is reversed with what is perceived by consumers. While *Questionable* (doubtful) is where the answer from consumers is not clear or less in accordance with the existing questions.

2.2 Location and Time of Study

The research was conducted at PT. Astra International Tbk-Daihatsu Branch Office Serang City, Banten. Data collection is done at service of the workshop, which the process of taking data is done since the beginning of April 2019 until the end of June 2019.

2.3 Data Collection

1. Primary Data: Observation, Interview, and IPA and KANO Questionnaire.

Secondary Data: Library and Company Documents.

2.4 Data Analysis

This data analysis uses the quantitative descriptive statistical technique, which is used to analyze data by describing or illustrating the processed data through the presentation of tables, graphs, diagrams, data dissemination by average, standard deviation and ratio without hypothesis nor significance test [5].

3. RESULT AND DISCUSSION

3.1 Test Adequacy Data

Data adequacy test was performed on the existing questionnaires using the Bernoulli equation. The sample used in this study includes a number of customer respondents s of service shop at PT.Astra International Daihatsu Branch Office Serang-Banten. The preliminary survey was taken as many as 35 respondents with 33 valid questionnaires and 2 invalid questionnaires. Thus the proportion of valid questionnaires 33/35 = 0.942 (p) and the proportion of invalid questionnaires is 2/35 = 0.057 (q).

In this study, a confidence level of 95% is used because the research is not a critical study, and the data used is considered to have error value or α of 5% acceptance. Then obtained:

$$n = \frac{(1{,}96)^2.(0{,}942).(0{,}057)}{(0{,}05)^2}$$

$$= 82{,}508 \approx 83$$

Therefore, the minimum sample that must be obtained is 83. In order to create a more convincing result, this research conducted the distribution of questionnaires as much as 100 questionnaires.

3.2 Importance Performance Analysis (IPA) Data Results

1. Correlation Level

   Correlation level analysis is used to determine the order of service improvement priorities; the results of correlation levels will be compared to KANO Model calculation results to determine of the best service improvement priorities to achieve desired customer satisfaction. The result of correlation level is shown in Table 2.

2. Average Interest Scores and Satisfaction

   The results of the average score of interest level and average scores of satisfaction level are obtained by dividing the total score of each attribute with the number of respondents of the questionnaire. Those results are shown in Table 3 and in the Cartesian diagram in Figure 1.

Table 2. Table of Correlation Level.

	Attribute	Satisfaction level (X)	Interest level (Y)	Conformity Level (%)
1	The strategic level of location of Daihatsu workshop (ease of access to the location, ease of exit and entry of the workshop area).	413	452	91,37
2	There is an information tool in the form of banners about the flow of car repair	474	439	107,97
3	The waiting room facility is very convenient for the customer (Adequate seating, the presence of a well-functioning TV, provided drinks and food).	410	428	95,79
4	Workshop facilities (reception room, waiting room, and toilet) are clean and very well maintained	424	438	96,8
5	The cleanliness of the vehicle after service (washed and vacuumed)	363	442	82,13
6	The workshop employees took the initiative to help the customers of the workshop	426	447	95,3
7	Workshop employee provides related information to perform the services periodically	402	435	92,41
8	The workshop employees always do 3S (Greetings, Smile, Greetings) to the customers	440	443	99,32
9	Follow up on the presence or absence of a complaint after a service conducted by the workshop	394	444	88,74
10	The Service Advisor has extensive knowledge of complaint receipt and is able to explain improvement suggestions that should be made	422	452	93,36
11	The timeliness of service of work in accordance with the estimated time given by the Service Advisor	353	444	79,5
12	Mechanics are able to repair the damage properly and appropriately	427	448	95,31
13	The proof of work done has been clearly defined and easily understood by the customer	429	431	99,54
14	Customer complaints are responded quickly and accurately and given appropriate explanation by the	394	440	89,55

	workshop officer			
15	Responsible workshop officer in conducting vehicle inspection before and after service	428	430	99,53
16	The checkout officer gives and explains in detail the overall costs incurred in the car repairs that have been made	438	439	99,77
17	The workshop guarantees the repairs that have been made (15 Days Warranty)	444	431	103,02
18	Security of goods contained in the vehicle at the time of service is assured	440	438	100,46
19	All spare parts are guaranteed authentic and competent workshop mechanics	452	445	101,57
20	The repair shop provides bonuses or discounts to customers. (If booking H-2 Service)	422	449	93,99

$$CL = \frac{Xi}{Yi} \times 100$$

Information :

CL = Conformity Level

Xi = Service Quality / Satisfaction Assessment Score
Yi = Score of Interest

3. Average Interest Scores and Satisfaction

The calculations that have been done furthermore charted into the Cartesian diagram. Cartesian diagram allows companies to make bring about improvement efforts on the attributes that are considered important by customers in order to achieve desired customer satisfaction. The points can be seen in the Cartesian diagram which is divided into 4 quadrants namely:

Quadrant I

Attributes that exist in quadrant I is a weakness or deficiency that belongs to PT. Astra International Daihatsu Branch Office of Serang-Banten City in the workshop service applied by the company. The attributes that go into quadrant I are:

a. Attribute 1: The strategic level of location of Daihatsu workshop (ease of access to the location, ease of exit and entry of the workshop area).
b. Attribute 5: The cleanliness of the vehicle after service (washed and vacuumed).
c. Attribute 9: Follow up on the presence or absence of a complaint after a service conducted by the workshop.
d. Attribute 11: The timeliness of service of work in accordance with the estimated time given by the Service Advisor.

Quadrant II

Quadrant II is a quadrant area which attributes must be maintained because the attributes in this quadrant are considered very important by customers and customers already feel the maximum service on the attributes in this quadrant. The attributes that enter into Quadrant II are:

a. Attribute 6: The workshop employees took the initiative to help the customers of the workshop.
b. Attribute 8: The workshop employees always do 3S (*Greetings, Smile, Greetings*) to the customers.
c. Attribute 10: The Service Advisor has extensive knowledge of complaint receipt and is able to explain improvement suggestions that should be made.
d. Attribute 12: Mechanics are able to repair the damage properly and appropriately.
e. Attribute 19: All spare parts are guaranteed authentic and competent workshop mechanics.
f. Attribute 20: The repair shop provides bonuses or discounts to customers. (If booking H-2 Service)

Quadrant III

Quadrant III is called low priority area, but it does not mean that attributes in this quadrant are not to be considered, because it is possible that in the future this attribute to be a mainstay or guidance service of Daihatsu workshop in running its service quality. The attributes that enter into Quadrant III are:

a. Attribute 3: The waiting room facility is very convenient for the customer (Adequate seating, the presence of a well-functioning TV, provided drinks and food).
b. Attribute 7: Workshop employee provides related information to perform the services periodically
c. Attribute 14: Customer complaints are responded quickly and accurately and given appropriate explanation by the workshop officer.

Quadrant IV

The fourth quadrant is an area that categorizes excessive areas. The attributes that enter into the quadrant IV are:

a. Attribute 2: There is an information tool in the form of banners about the flow of car repair.
b. Attribute 4: Workshop facilities (reception room, waiting room, and toilet) are clean and very well maintained.

c. Attribute 13: The proof of work done has been clearly defined and easily understood by the customer.
d. Attribute 15: Responsible workshop officer in conducting vehicle inspection before and after service.
e. Attribute 16: The checkout officer gives and explains in detail the overall costs incurred in the car repairs that have been made
f. Attribute 17: The workshop guarantees the repairs that have been made (15 Days Warranty).
g. Attribute 18: Security of goods contained in the vehicle at the time of service is assured.

Attribute	Average Satisfaction (X)	Average Interest (Y)
1	4,13	4,52
2	4,74	4,39
3	4,1	4,28
4	4,24	4,38
5	3,63	4,42
6	4,26	4,47
7	4,02	4,35
8	4,4	4,43
9	3,94	4,44
10	4,22	4,52
11	3,53	4,44
12	4,27	4,48
13	4,29	4,31
14	3,94	4,4
15	4,28	4,3
16	4,38	4,39
17	4,44	4,31
18	4,4	4,38
19	4,52	4,45
20	4,22	4,49
Average	4,20	4,41

Table 3. Average Scores of Satisfaction and Interest.

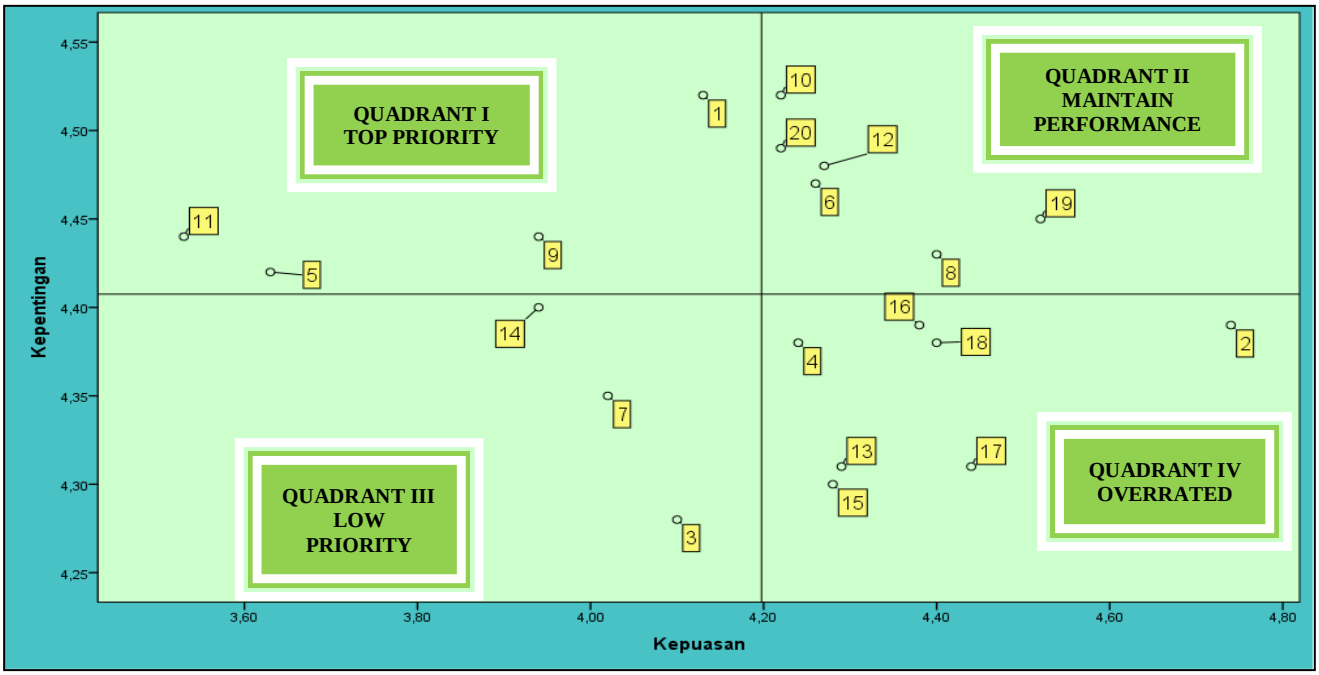

Figure 2. Cartesian Diagram of IPA Method Result

3.3 KANO Model

1) KANO Model Attribute Classification

The result of the classification of each attribute based on the KANO evaluation table are shown in Table 4. From that table, we can see that as many as 100 respondents who fill the Kano Model questionnaire and consists of 20 attributes of functional and dysfunctional questions that are then classified using the KANO evaluation table.

2) Recap of Kano Model Result

After each response, the attributes are categorized into A, O, M, I, Q or R. Then, the number of each category in each service attribute is calculated. Each attribute in KANO category is determined as follows:

a) If (O+A+M) > (I+R), then the service attribute category is the maximum result of (O, A, M)

b) If (O+A+M) < (I+R), then the KANO category for the service attribute is the maximum result of (I, R)

Table 4. Results of KANO Evaluation

Attribute	A	O	M	I	Q	R	TOTAL

1	31	25	6	38	0	0	100
2	41	11	8	40	0	0	100
3	13	75	9	3	0	0	100
4	7	78	13	2	0	0	100
5	21	53	13	13	0	0	100
6	26	54	10	10	0	0	100
7	28	19	8	45	0	0	100
8	9	70	18	3	0	0	100
9	42	8	5	45	0	0	100
10	31	41	1	27	0	0	100
11	26	49	1	24	0	0	100
12	5	80	10	5	0	0	100
13	19	35	44	2	0	0	100
14	12	66	15	7	0	0	100
15	22	48	22	8	0	0	100
16	12	55	27	6	0	0	100
17	21	51	8	20	0	0	100
18	16	61	5	18	0	0	100
19	7	84	8	1	0	0	100
20	30	36	1	33	0	0	100

Kano Model recapitulation is shown in Table 5. Then, the result of Kano Model is charted as in Figure 2.

Table 5. Kano Model Recapitulation

ATRIBUT	A	O	M	I	Q	R	TOTAL	O+A+M	I+R	GRADE
1	31	25	6	38	0	0	100	62	38	A
2	41	11	8	40	0	0	100	60	40	A
3	13	75	9	3	0	0	100	97	3	O
4	7	78	13	2	0	0	100	98	2	O
5	21	53	13	13	0	0	100	87	13	O
6	26	54	10	10	0	0	100	90	10	O
7	28	19	8	45	0	0	100	55	45	A
8	9	70	18	3	0	0	100	97	3	O
9	42	8	5	45	0	0	100	55	45	A
10	31	41	1	27	0	0	100	73	27	O
11	26	49	1	24	0	0	100	76	24	O
12	5	80	10	5	0	0	100	95	5	O
13	19	35	44	2	0	0	100	98	2	M
14	12	66	15	7	0	0	100	93	7	O
15	22	48	22	8	0	0	100	92	8	O
16	12	55	27	6	0	0	100	94	6	O
17	21	51	8	20	0	0	100	80	20	O
18	16	61	5	18	0	0	100	82	18	O
19	7	84	8	1	0	0	100	99	1	O
20	30	36	1	33	0	0	100	67	33	O

3.4 Results of Data Processing Integration Importance Performance Analysis (IPA) and KANO Model

After processing the data of IPA (Importance Performance Analysis) method and Kano Model questionnaire, the next step is to integrate the results of the two methods. The result of the integration of IPA and Kano Model is a diagram according to the result of Cartesian IPA diagram which consists of 4 quadrants, which are then adjusted according to the result of Kano Model. The results of service quality measurement using the method of IPA and KANO can be seen in Figure 3.

3.5 Results of Data Processing Integration Importance Performance Analysis (IPA) and KANO Model

After processing the data of IPA (Importance Performance Analysis) method and Kano Model questionnaire, the next step is to integrate the results of the two methods. The result of the integration of IPA and Kano Model is a diagram according to the result of Cartesian IPA diagram which consists of 4 quadrants, which are then adjusted according to the result of Kano Model. The results of service quality measurement using the method of IPA and KANO can be seen in Figure 3.

Furthermore, the researcher proposed the improvement using 5W + 1H tools. The aim of this method is to find out the problems that occur in detail. The proposed improvements are shown in Table 6.

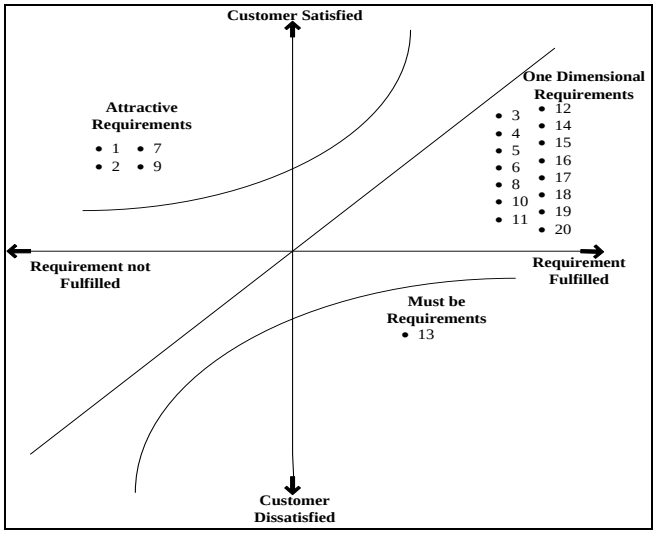

Figure 1. Result of KANO Model

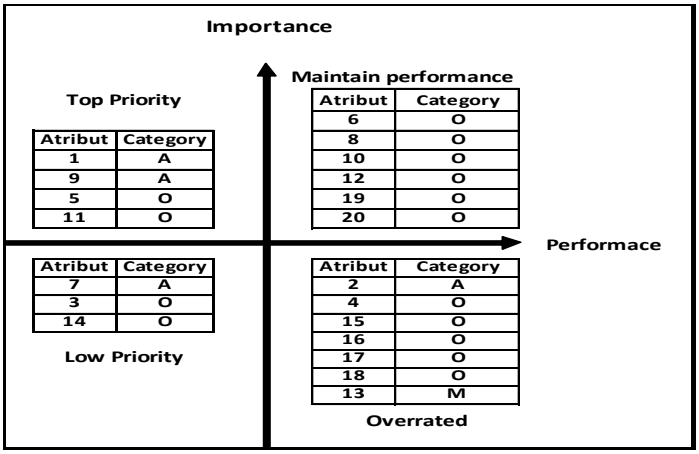

Figure 2. Diagram of Integration Result of IPA and Kano Model

What	Why	Where	When	Who	How
The strategic level of location of Daihatsu workshop (ease of access of the location, ease of exit and entry of the workshop area).	Customers have difficulty accessing the workshop area in and out because there is only one entrance access door.	Pt. Astra International Daihatsu Branch Office Serang City.	When there are customers who enter or exit the workshop area, the customers have to give up one and the other.	Management of PT. Astra International Daihatsu Branch Office Serang City	Daihatsu Serang should create two access doors and separate the entry and exit of the workshop area.
Follow up on whether there is a complaint after service performed by the workshop.	Customers feel the lack of attention of workshop officers to follow up, therefore not all customers receive the information of after service warranty.	Pt. Astra International Daihatsu Branch Office Serang City.	Customer Relations of PT.Astra International Daihatsu Branch Office Serang City.	*Customer Relations* PT.Astra International DaihatsuBranch *Office* Serang City.	Daihatsu Serang Especially the Customer Relations department should provide follow up after service to all customers who have the service done about any occuring complaint.
Condition of clean vehicle after service (washed and vacuum).	Customers expect the condition of the vehicle after being washed as clean as car wash service results in general. But the car wash conducted by the workshop only aims to remove the stains of former service.	Pt. Astra International Daihatsu Branch Office Serang City.	When customers check the state of the car after service.	Team Officer of Vehicle Wash PT. Astra International Daihatsu Branch Office Serang City.	The vehicle washers should inform the customers whether to the purpose of the washing of the car is to remove stains of car repair or to maximize the quality of car wash work.
Timeliness of service work in accordance with the estimated time given earlier by the Service Advisor.	Discrepancy between the actual service work and the estimated service worktime previously given by the service advisor.	Pt. Astra International Daihatsu Branch Office Serang City.	When the customer waits for the completion of the vehicle in service.	The mechanical team of PT.Astra International Daihatsu Branch Office Serang City	Daihatsu Serang workshop should add mechanics to each workstation in order to to optimize the service worktime.

4. CONCLUSION/KESIMPULAN

4.1 Conclusion

Based on the results of data collection, processing and analysis that have been conducted in the previous chapter, it can be concluded based on the integration of IPA method and KANO method that there are 7 service workshop attributes that must be improved by the company. Here are the priority attributes to be fixed:

1. The strategic level of location of Daihatsu workshop (ease of access to the location, ease of exit and entry of the workshop area).
2. Follow up on the presence or absence of a complaint after a service conducted by the workshop.
3. The cleanliness of the vehicle after service (washed and vacuumed).
4. The timeliness of service of work in accordance with the estimated time given by the Service Advisor.
5. Workshop employee provides related information to perform the services periodically (when to do next service).
6. The waiting room facility convenient for the customer (Adequate seating, the presence of a well-functioning TV, provided drinks and food).
7. Customer complaints responded quickly and accurately and given the right explanation by the workshop officer.

4.2 Recommendation

Based on the results of research that has been conducted, in order to implement the improvements efforts the researchers have recommendations for the company, including for services that must be improved:

1. Divide the access of Daihatsu workshop area into two lanes, that is the entrance and the exit.
2. Conduct a follow up of complaints after the vehicle is

serviced for all customers instead of sampling.
3. Add a number of service advisors to maximize the service quality.
4. Add a number of workshop technicians. For example, 1 workstation is to be manned by 3 to 4 technicians.

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