

INTEGRATION OF IMPORTANCE-PERFORMANCE ANALYSIS (IPA) AND KANO IN IMPROVING SERVICE QUALITY IN PDAM DISTRICT PENAJAM PASER UTARA

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ABSTRACT

PDAM District Penajam Paser Utara is a company engaged in the service sector. In the service sector, service quality must be considered to meet customer satisfactions who use these services. PDAM districts Penajam Paser Utara has tried to provide the best service. However, there are still complaints from customers, so research is needed using Integration Importance-Performance Analysis (IPA) and Kano to prioritize what attributes should be improved, maintained, and reduced. The results show that the quadrant I research category is the main priority to increase E3 complaints and suggestions that are well responded to, T1 air cleanliness, T4 air sufficiency, RS1 the responsiveness of officers if customer complaints, RS2 officers' willingness to provide the needed assistance, A1 guarantees officers to provide services are polite and friendly, and E1 information given to customers is clear.

Keywords: Service Quality, Customer Satisfaction, Importance-Performance Analysis (IPA), Kano

1. Introduction

In the current era of globalization, clean water is something that people need in their daily life; In the past, clean water was effortless to obtain, but now clean water is starting to be challenging to obtain, so it is necessary to establish a Regional Drinking Water Company (PDAM) to meet community needs

PDAM is a community service agency managed by local governments that focuses on fulfilling community satisfaction by providing clean water and quality public services. To meet customer satisfaction, PDAM must identify what factors can affect customer satisfaction and then continue to measure customer satisfaction because the goal of public sector organizations such as PDAMs at a macro level is to create community welfare.

Because water is a primary need in life that has a vital role in supporting the community's prosperity and welfare, PDAM districts Penajam Paser Utara is here to improve clean water services and public services to the community. PDAM districts Penajam Paser Utara is divided into five units: the Penajam unit, the Sepaku unit, the Waru unit, the Sotek unit, and the Maridan

unit. Here the researcher will examine how the service quality of one of the units, namely the Sotek unit, in the customer's eyes; the researcher researches the Sotek unit because it is still relatively new.

Service quality is important to note because it can be a measuring point for developing a company or an agency. This research was conducted to determine the service that has been felt by customers so that it can be seen how the level of satisfaction felt by customers. Based on the results of preliminary observations, the researcher found that there were several customer complaints to the PDAM districts Penajam Paser Utara Unit Sotek, such as fewer water supplies during the dry season, customers do not get water supply on the scheduled day, and when floods occur during the rainy season the water turns yellow. The PDAM has tried to take several actions to resolve customer complaints, but these actions are still not optimal.

2. Literature Review

1. Operational Management

Operational Management is a series of processes that change input into the output to become goods and services through planning, organizing, directing, and supervising activities (Hasan, 2011).

Operations management is a series of activities that create value from goods and services by converting inputs into outputs. (Heizer & Render, 2011)

Operational activity is related to the creation or manufacture of goods, services, or their combination through the transformation process from the input of production resources to the desired output (Prasetya & Lukiasuti, 2016).

2. Service

Services in Operations Management include the provision, maintenance, and various services needed to serve customers. Its main task is to protect industrial and service operations.

This service is hardly considered significant as long as all facilities are in good working order. However, if you look carefully, service is essential to be considered in the company. (Akhmad, 2018)

3. Service Quality

Service quality is how far the difference between reality and customer needs for the service they have received. (Taufiqurokhan & Satsipi, 2018)

There are five dimensions of service quality, along with their definitions as follows:

1. Tangibles include facilities, employees, equipment, and means of information or communication.
2. Reliability Includes the ability to provide the promised service immediately, accurately, and satisfactorily.
3. Responsiveness includes the desire of employees to help and provide responsive services.
4. Assurance includes providing guarantees to customers so that they are free from risk, danger, and doubt.
5. Empathy includes the ability of employees to give full attention to customers (Zeithaml, Parasuraman, & Berry, 1990)

4. Customer Satisfaction

Customer Satisfaction is an essential factor to determine whether customers are satisfied with the company's performance. If a customer is satisfied with a product or service, this can make the customer stay with a company. However, if the customer is not satisfied with the service, this can cause the customer to switch to another company. (Taufiqurokhan & Satsipi, 2018)

5. IPA (Importance-Performance Analysis)

IPA (Importance-Performance Analysis) is a procedure to show the relative importance of various attributes in determining the necessary attributes to identify areas or attributes for improving service quality (Wijaya Tony, 2018). Four quadrants become strategies for improving employee performance in maintaining or improving the service quality.

1. Quadrant I

Quadrant I shows the attributes that customers consider necessary, but this quadrant's attributes are not by what the customers expect (low customer satisfaction).

2. Quadrant II

Quadrant II shows the attributes that customers consider necessary, and these attributes are by customer expectations.

3. Quadrant III

Quadrant III shows the attributes that are considered less critical by customers, and the performance of these attributes is underperforming according to the customers.

4. Quadrant IV

Quadrant IV shows the attributes that are considered less important by the customer and that the customer has extreme performance. (Wijaya Tony, 2018)

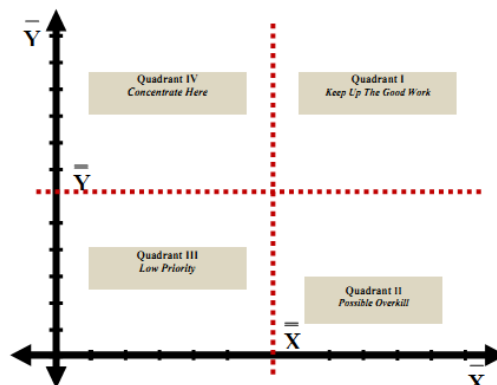


Figure 1. Importance-Performance Matrix (Cartesian Diagram)

6. Kano Model

Kano et al. (1984) developed a model to categorize the attributes of a product or service based on how well they can satisfy customer needs. The following are the popularly named Kano customer need categories :

1. Basic needs. Of these needs, customers become dissatisfied when the performance of the product attributes is low. However, customer satisfaction does not rise above neutral even with high-performance product attributes. For example, having an unfriendly sales assistant causes customer dissatisfaction. However, having a friendly sales assistant does not increase customer satisfaction levels.
2. The one-dimensional or performance needs. For these needs, customer satisfaction is a

linear function of the performance of the product attribute. High attribute performance leads to high customer satisfaction. For example, in consumer shopping, a discount is likely to be a performance need where-within limits, more significant discounts result in higher customer satisfaction.

3. The attractiveness or excitement needs. For these needs, customer satisfaction increases super linearly with increasing attribute performance. There is, however, not a corresponding decrease in customer satisfaction with a decrease in attribute performance. For instance, a cosmetics customer may not be dissatisfied if there is no free bonus but maybe more satisfied if a bonus is provided

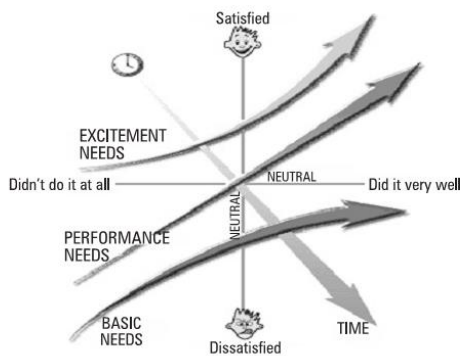


Figure 2. Kano's Model

Source: Reproduced from ReVelle et al. (1998)

3. Methods

There are two analysis tools used in this research, namely Importance-Performance Analysis (IPA) model analysis, which is used to measure the relationship between consumer opinion and the priority of improving service quality attributes known as Quadran Analysis. The stages in the Importance-Performance Analysis (IPA) method are as follows:

1. Determine the level of conformity
2. Calculate the average for each attribute
3. Calculate the average level of performance and importance attributes, which will be the limit on the Cartesian diagram
4. Mapping into the Cartesian diagram as shown in Figure

The first used kano model is to classify attributes according to two kinds of questions, namely functional questions, which are customer responses if the indicators work well, and dysfunctional questions, namely customer responses if the indicators do not work well based on table 1

Table 1. Evaluation Of The Kano Model

Customer requirement	Dysfunctional				
	Like (5)	Must-be (4)	Neutral (3)	Live with (2)	Dislike (1)
like (5)	Q	A	A	A	O
Must-be (4)	R	I	I	I	M
Neutral (3)	R	I	I	I	M
Live with (2)	R	I	I	I	M
Dislike (1)	R	R	R	R	Q

Source: (Nengsi et al., 2016)

Determine from the Kano category using the Blauth formula:

1. If the number (O + A + M) > the total value (I + R + Q), then the determination of the canoe category is obtained from the most considerable value (O, A, M)
2. If the total value (O + A + M) < the total value (I + R + Q), then the determination of the canoe category is obtained from the most considerable value (I, R, Q)
3. If the total value (O + A + M) = the total value (I + R + Q), then the canoe category is obtained from the most outstanding value among all categories (O, A, M, I, R, Q)

If better than (IBT), which is between 0 and 1, is used to calculate the coefficient of customer satisfaction. If the closer to value 1, the consumer can be said to be more satisfied. IBT is calculated using the formula:

$$IBT = \frac{A + O}{A + O + M + I}$$

If Worse Than (IWT), between 0 and -1 is used to calculate the dissatisfaction coefficient. The closer to the value -1, the consumer can be said to be more disappointed. IWT is calculated using the formula:

$$IWT = \frac{M + O}{A + O + M + I}$$

The integration of the IPA and the Kano Model is combining the IPA method results and the Kano Model to see which indicators need to be maintained and improved.

After getting the attributes in the Importance-Performance Matrix, which are included in quadrants I, II, III, and IV, and obtaining the attributes that fall into the Kano category, the next step is to integrate the type of attribute based on the Kano category with the identification of the quadrant on Importance -Performance Matrix. So that what service attributes must be met, improved, and maintained in order to increase satisfaction with the company.

How to determine priority attributes based on Importance-Performance Analysis (IPA) and the canoe model as follows:

1. Priority-based on the Importance-Performance Analysis (IPA) method as follows (Nengsi, Lestari, & Husna, 2016):

- 1) Quadrant I (top priority)
 - 2) Quadrant II (maintaining achievement)
 - 3) Quadrant III (low priority)
 - 4) Quadrant IV (excessive)
2. For quadrant II and quadrant IV, it is considered a strength so that the order of priority for the canoe category is as follows (Wu et al. 2010):
 - 1) Attractive (interesting)
 - 2) One Dimensional (one size)
 - 3) Must Be (must)
 3. Quadrant I and quadrant III can be considered as weaknesses, so the order of priority for the canoe category is as follows (Wu et al., 2010):
 - 1) Must be (must be)
 - 2) One Dimensional (one size)
 - 3) Attractive (interesting)
 4. If there are the same attributes in the canoe category, the level of importance can be a "weight" to differentiate them (Wu et al., 2010).

4. Analysis

Identification of Service Attributes with Importance-Performance Analysis (IPA), the average calculation results for the level of expectation and the level of performance for each attribute can be seen in table 2

Table 2. The results of the calculation of the average level of expectation and performance

NO	Attribut Code	Questions	expectation	performanc e
1	T1	water cleanliness	4,9	3.77
2	T2	Water color	4,9	4.47
3	T3	timeliness of running water	4,7	2.73
4	T4	sufficient water	4.89	4.16
5	T5	availability of a good water meter	4.4	4.83
6	T6	the quality of the water flow pipe is good	4.43	4.83
7	RL1	office services that open and close according to time ease of	4.78	4.96
8	RL2	administration payment system	4.82	4.82
9	RS1	the responsiveness of officers in handling customer complaints	4.96	4
10	RS2	willingness of officers to provide assistance if needed	4.89	4.22
11	RS3	attendants provide service quickly	4.96	4.29
12	A1	guarantee officers provide polite and friendly service	4.93	4
13	A2	Guarantee that officers have the knowledge and are able to provide information and repair damage in the field	4.93	4.82
14	A3	payment guarantee according to the account provided	4.89	5
15	E1	information provided to customers is clear	4.96	3.43
16	E2	said the officer nicely	4.46	4.35
17	E3	complaints and suggestions are well responded to	4.49	4.06

Source: Processed Data, 2020

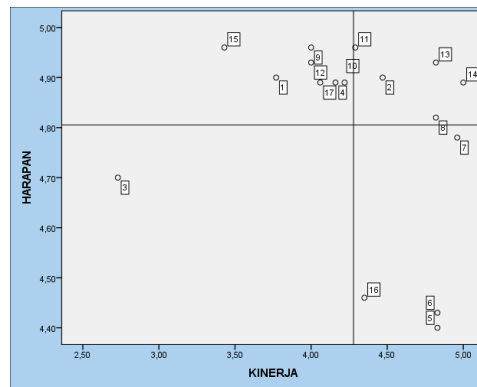


Figure 3. Importance-Performance Analysis (IPA) Diagram
Source: Processed Data SPSS, 2020

From the results of the calculation of the average level of expectation and the level of performance obtained, it is made into an Importance-Performance Analysis (IPA) diagram by placing the expectation level score as a horizontal axis (X) and the performance level score as the vertical axis (Y) so that the grouping results can be seen. Attributes into each Importance-Performance Analysis (IPA) quadrant as shown in Figure 3.

Based on the results of the Importance-Performance Analysis (IPA) diagram above, the service attributes of PDAM districts Penajam Paser Utara can be grouped in each quadrant. The attributes included in quadrant I can be seen

in table 3

Table 3. Service Attribute Quadrant I

Dimensi on	Attribute Code	Question
Tangible	T1	Water cleanliness
	T4	Sufficient water
Responsiveness	RS1	The responsiveness of officers in handling customer complaints
	RS2	Willingness of officers to provide assistance if needed
Assurance	A1	Guarantee officers provide polite and friendly service
Empathy	E1	Information provided to customers is clear
	E3	Complaints and suggestions are well responded to

Source: processed data, 2020

The attributes included in quadrant II can be seen in table 4

Table 4 Service Attribute Quadrant II

Dimensi on	Attribute Code	Question
Tangible	T2	Water color
Reliability	RL2	Ease of administration payment system
Responsiveness	RS3	Attendants provide service quickly
Assurance	A2	Guarantee that officers have the knowledge and are able to provide information and repair damage in the field
	A3	Payment guarantee according to the account provided

Source: processed data, 2020

The attributes included in quadrant III can be seen in table 5

Table 5 Service Attribute Quadrant III

Dimensi	Attribute Code	Question
Tangible	T3	Timeliness of running water

Source: processed data, 2020

The attributes included in quadrant IV can be seen in table 6

Dimensi	Attribute Code	Question
Tangible	T5	Availability of a good water meter
	T6	The quality of the water flow pipe is good
Reliability	RL1	Office services that open and close according to time
Empathy	E2	Said the officer nicely

Source: processed data, 2020

Identification of Attributes with the Kano Model is carried out to see how well a service attribute can be seen in table 7

Table 7 Results Of Classification Of Service Attributes In The Kano Category

attribute code	A	O	M	I	Q	R	Category	IWT	IBT
T1	60	0	0	5	17	1	A	0	0,92
T2	37	25	0	5	8	8	A	-0,37	0,58
T3	40	3	23	10	6	0	A	-0,34	0,56
T4	42	0	0	8	33	0	A	0	0,84
T5	41	10	0	2	37	2	A	-0,15	0,79
T6	49	11	0	4	45	1	A	-0,17	0,93
RL1	44	0	14	24	0	1	A	-0,17	0,53
RL2	36	25	0	10	3	9	A	-0,35	0,85
RS1	53	0	0	3	27	0	A	0	0,94
RS2	47	0	0	3	30	3	A	0	0,94
RS3	47	0	0	4	32	0	A	0	0,92
A1	44	0	0	6	33	0	A	0	0,88
A2	44	0	0	1	0	8	A	0	0,98
A3	74	0	0	0	0	9	A	0	1
E1	42	1	7	3	30	0	A	-0,15	0,81
E2	28	26	0	2	4	4	A	-0,33	0,69
E3	13	1	48	3	2	16	M	-0,75	0,21

Source: processed data, 2020

Based on the identification results with the canoe model, it is known that there are 16 attributes included in the attractive category, and one attribute included in the must be a category.

The IPA-Kano integration combines the results of the Importance-performance IPA analysis method with the Kano model results. At this stage, categorization and priority order for

each service attribute of PDAM districts Penajam Paser Utara sharpener can be seen in table 8

Table 8 Sequence Of Priority Integration Importance-Performance Analysis (IPA) And The Kano Model

Attribut Code	Questions	IPA category	Kano Categori	repair priority
E3	Water cleanliness	Quadrant I	M	Improved
T1	Water color	Quadrant I	A	Improved
T4	Timeliness of running water	Quadrant I	A	Improved
RS1	Sufficient water	Quadrant I	A	Improved
RS2	Availability of a good water meter	Quadrant I	A	Improved
A1	The quality of the water flow pipe is good	Quadrant I	A	Improved
E1	Office services that open and close according to time	Quadrant I	A	Improved
T2	Ease of administration payment system	Quadrant II	A	Maintained
RL2	The responsiveness of officers in handling customer complaints	Quadrant II	A	Maintained
RS3	Willingness of officers to provide assistance if needed	Quadrant II	A	Maintained
A2	Attendants provide service quickly	Quadrant II	A	Maintained
A3	Guarantee officers provide polite and friendly service	Quadrant II	A	Maintained
T3	Guarantee that officers have the knowledge and are able to provide information and repair damage in the field	Quadrant III	A	Maintained
T5	Payment guarantee according to the account provided	Quadrant IV	A	Be diminished
T6	Information provided to customers is clear	Quadrant IV	A	Be diminished
RL1	Said the officer nicely	Quadrant IV	A	Be diminished
E2	Complaints and suggestions are well responded to	Quadrant IV	A	Be diminished

Source: processed data, 2020

quality using the Importance-Performance Analysis (IPA) and Kano methods, it can be seen that the attributes that need to be prioritized for improvement are the E3 attribute, namely complaints and suggestions that are well responded to. Customers feel that officers do not respond well to complaints and suggestions even though the level of importance of this attribute is very high. Because the E3 attribute is included in the must be a category, the customer will feel dissatisfied if the performance of the officer in handling this attribute is low, but if the officer in handling customer complaints has been fulfilled, then customer satisfaction will not increase much above neutral because the customer feels that this attribute should be there is.

Other attributes that need to be improved are in quadrant I, namely T1 water cleanliness, T4 water adequacy, RS1 officers responsiveness in handling customer complaints, RS2 officers willingness to assist if needed, A1 guarantees officers provide courteous and friendly service, and E1 information provided to clear customer. The six attributes in quadrant I am in the attractive canoe category, so that if these six attributes have an excellent performance, customer satisfaction will also increase.

The attributes that need to be maintained in quadrant II are T2 watercolor, RL2 ease of administration payment system, RS3 officers provide fast service, and A2 guarantees that officers have the knowledge and can provide information and repair damage in the field. The five attributes in quadrant II are in the attractive canoeing category so that if these five attributes have an excellent performance, customer satisfaction will also be high.

The attribute that needs to be maintained in quadrant III is T3, the timeliness of water flowing. For this attribute, it is in the attractive canoeing category, so if this attribute has excellent performance and is maintained, customer satisfaction will also be high.

The attributes that need to be reduced in quadrant IV are T5, the availability of an adequate water meter, T6 good water pipe quality, RL1 office services that open and close according to time, and E2, said the official well. This attribute is in the attractive Kano category, so if this attribute has an excellent performance, then customer satisfaction will also be high. However, because this quadrant's attributes are excessive, they must be lowered and prioritized by increasing the quadrant I's attributes.

5. Conclusion

Based on the results of previous research, the following conclusions can be drawn:

1. The service quality attribute in the quadrant I category and the main priority for improvement are complaints and suggestions E3, which have been responded to well., T1 water cleanliness, T4 water adequacy, RS1 officers responsiveness in handling customer complaints, RS2 officers' willingness to assist if required, A1 guarantees officers provide courteous and friendly service and E1 information provided to customers is apparent.
2. Attributes of service quality that fall into the category II and III quadrants must be maintained are T2 the color of water, RL2 the ease of the administrative payment system, RS3 officers provide fast service, A2 guarantees that officers have the knowledge and can provide information and repair

damage in the field and T3 punctuality of running water

3. The service quality attributes that fall into the quadrant IV category that must be reduced in performance are T5, the availability of an adequate water meter, T6 good water pipe quality, RL1 office services that open and close according to time, and E2, the official said well.

From the above conclusions, there are several suggestions for this study:

1. The PDAM immediately improves the service quality attribute in quadrant I, namely E3 complaints and suggestions are well responded to, T4 is sufficient water (when water flows in a week), RS1 is the responsiveness of officers in handling customer complaints, RS2 is willingness of officers to provide assistance if needed, A1 guarantee officers provide polite and friendly service and E1 information provided to customers is clear, on the 6 service quality attributes above the authors suggest that company management provide training to officers in the field in order to have a sense of empathy for customers, T1 water cleanliness on service quality attributes This writer suggests that before distributing water to customers, the officer checks how the cleanliness of the water will be flowed, the quality of this service, the author suggests that the company management provide training to officers in the field in order to have a sense of empathy for customers so that officers can always be willing to give help if needed.
2. The PDAM needs to maintain service quality attributes in quadrants II and III, namely RS3 officers providing fast service quality attributes. The author suggests that officers maintain their performance in providing fast service, A2 guarantees that officers have the knowledge and can provide information and repair damage in the field on this service quality attribute, the author suggests that company management can provide regular training to field officers so that officers can maintain their performance in the field and T3, the accuracy of the flow of water in this attribute, the authors suggest that the company maintains the timeliness of water flowing.
3. The PDAM can reduce the performance of the service quality attributes in quadrant IV, namely T5, the availability of a good water meter, T6 good water pipe quality, RL1 office services that open and close according to time E2 said the official well. In the four attributes of service quality above, the authors suggest reducing the performance of these service quality attributes and pay more attention to the

service quality attributes in quadrant I to be immediately improved or repaired.

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