Enhancing Customer Satisfaction of An Electrical and Lighting Maintenance Company PLP

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Abstract. Service quality is one of the essential values of a service company. Good service quality is one of the keys for service companies to be able to compete with competitors and ensure that consumers do not switch to others. PLP is an electrical and lighting maintenance service company. A preliminary customer satisfaction survey was conducted with 28 sample respondents, and it was discovered that the percentage score of dissatisfied customer satisfaction was 32%, and very dissatisfied customer satisfaction was 7%, where these scores still did not meet the maximum customer satisfaction indicators. The purpose of this research is to assess customer satisfaction with electrical and lighting maintenance services offered by PLP and to determine which attributes should be prioritized as needing improvement. This study uses the integration of service quality, importance–performance analysis (IPA), and Kano methods. The gap between importance and performance is reflected in customer satisfaction. A survey was distributed to 45 customers of PLP Company. All of the items in this questionnaire on five quality dimensions were determined by SPSS. The results of this study's gap scores for reliability, responsiveness, assurance, empathy, and tangibles are -0.364, -0.409, -0.467, -0.462, and -0.111. This indicates that PLP customers are not satisfied. Then, this study obtained six service attributes that need to be improved.
Keywords: Importance Performance Analysis, Kano Model, Maintenance, Service Quality

1. Introduction

As quality standards improve around the world and maintenance work becomes more standardized, companies, especially service companies, will have to deal with more complicated problems. Maintenance actions for keeping the equipment in good condition consist of preventive maintenance (PM) and corrective maintenance (CM) actions [1]. If the company has the required technological resources and skills, it will perform these maintenance activities (called "in-house maintenance"). Otherwise, the maintenance jobs are delegated to a third party. Additionally, many firms prefer to subcontract maintenance services to an outside agent for financial reasons—outsourcing is more efficient [2]. In other words, the business must choose a maintenance service contract from among those provided by OEMs (original equipment manufacturers) or agents that fulfill its needs. Maintenance services are classified into three categories: (i) general, (ii) consumer perspective, and (iii) industrial sector [3].

Services are activities, benefits, or satisfaction offered for sale. Services are defined as any actions or activities that can be offered by a party to another party and are intangible and do not produce any ownership [4]. There are two dimensions to measuring service quality: 1) the objective dimension, by which performance indicators (e.g., capacity, speed, reliability, and frequency) can be expressed to objectify the service quality; and 2) the subjective dimension, which can only be evaluated through understanding customer perceptions [5].

IPA can be evaluated to determine the strengths and weaknesses of a service based on two components of client evaluations: the importance of the attribute and its performance [6]. Each product or service attribute's relative importance and level of satisfaction can be measured, compared, and analyzed all at

once using IPA. The IPA grid is divided into four quadrants by the vertical axis, which the importance measure represents, and the horizontal axis, which the performance measure represents [7]. Specifically, in a two-dimensional analysis matrix, performance and importance are the coordinates for the plotting of attribute quality [8][9]. Four quadrants indicate the areas where improvement efforts are potentially excessively satisfactory, lacking, or of relatively little importance [6], [9].
The Kano model classifies the features of products into five categories, namely: must be, one-dimensional, indifferent' and reverse, and attractive [10][11]. It has been one of the most popular approaches for determining the connection between client wants and requirements and matching them with the features and functionality of the product [12]. It involves the administration of a questionnaire that mainly concerns consumer requirements and includes questions both in the "dysfunctional" and "functional" designs [13]. Respondent selects from the following options: "live-with," "must-be," "dislike," "neutral" or "like." Kano's methodology offers a rational strategy for boosting customer happiness, despite the fact that it would be challenging to measure in any other way [14]. The relationship between customer preferences and the overall satisfaction quotient can be established with the help of the Kano model [12].
PLP is an electrical and lighting maintenance service company. A preliminary customer satisfaction survey was conducted with 28 sample respondents, and it was discovered that the percentage score of dissatisfied customer satisfaction was 32%, and very dissatisfied customer satisfaction was 7%, where these scores still did not meet the maximum customer satisfaction indicators. The purpose of this study is to assess customer satisfaction with electrical and lighting maintenance services offered by PLP and determine which attributes should be prioritized as needing improvement. This study uses the integration of service quality, importance–performance analysis (IPA), and Kano methods.

2. Methods

The object of this research is PLP Company, an electrical and lighting maintenance service company. Data collection for this study was carried out by distributing questionnaires to customers of PLP in 2022. The number of samples in this study was 45 respondents; this number met the minimum sample size, and the research sample represented the entire population.
There are 25 attributes tested in this study as indicators of quality assessment from customers of PLP services. These attributes refer to previous research and are adjusted based on the conditions of the PLP company through interviews conducted with site managers, supervisors, project managers, and team leaders. The people who were interviewed had worked in electrical and lighting maintenance for more than 10 years, so they knew enough about the subject of this study to be useful.
There are three types of questionnaires used, each with questions about PLP customers' expectations about the type of service provided, to determine the level of importance of the attributes tested. The second questionnaire contains questions to measure consumer expectations and service performance perceived by customers, namely whether the service provided is optimal or not.
The scale used in the questionnaire is a Likert scale with a value of 1 to 5. The Likert scale of customer expectations has a value of 1 for not expecting and a value of 5 for really expecting. A service performance scale with a value of 1 indicates dissatisfaction, and a value of 5 indicates extreme satisfaction. Customers are asked to fill in the level of expectation and service performance that have been provided by the PLP company in providing electrical and lighting maintenance services.
The third questionnaire is a Kano questionnaire, in which respondents are asked to react to questions concerning the functional and dysfunctional elements of the attribute in issue. The answer choices that have been provided are like, expect, neutral, and tolerate.
The following steps were taken to integrate this method:

- Servqual method. This method is to determine customer satisfaction with the quality of service provided by PLP to customers in terms of the performance of electrical and lighting maintenance services against customer expectations. Attributes that have a negative gap score will be evaluated further.
- IPA method. This method is to find out which attributes are the top priority, or quadrant I.

- Kano Method. This method is to categorize each service attribute based on how well it can satisfy customer needs. These attribute categories include "must-be," "one-dimensional," and "attractive."

3. Result and Discussion

3.1. Validity dan Reliability Testing

Based on the results of the validity and reliability tests that have been carried out, it is known that all questions are valid and reliable. In total, 45 valid questionnaires were retrieved; the retrieval accuracy percentage was 97.8%. SPSS 17 analysis software was used to examine the 25 questions of the SEVRQUAL scale for reliability using the obtained questionnaires. The findings of the analysis indicated that the internal consistency coefficient of the predicted value of Cronbach's alpha was 0.769 and the internal consistency coefficient of satisfaction of Cronbach's alpha was 0.778, indicating an acceptable level of reliability.

3.2. Service Quality Analysis (SERVQUAL)

After verifying the validity and reliability of the questionnaires, data were gathered by distributing questionnaires to assess if the quality of PLP's services fulfilled consumer expectations. Included in the five dimensions of service quality are the research attributes evaluated in this study.

- The tangible dimension has a tangible manifestation in the form of infrastructure facilities, equipment, employees, and information or communication facilities. This can mean the completeness of safety and electrical equipment, communication facilities, and employee appearance.
- The reliability dimension is the awareness of the trustworthiness of a product or service and the ability to deliver the promised performance quickly, accurately, and satisfactorily. In this case, service providers are required to provide reliable services. There must be no failure or delay.
- The responsiveness dimension shows the readiness to manage customer complaints. Response time to resolve customer-level complaints is necessary to provide the support, solutions, and alternative information that customers need.
- This assurance dimension includes staff knowledge, skill, courtesy, and trustworthiness.
- The dimension of empathy (empathy) is the ability to give full attention to customers, ease in entering into contracts, communicate well, and understand the needs of individual customers.

To find out the attributes that give the smallest contribution, the average customer expectations and the average PLP service performance are calculated, and the gaps for each attribute are determined. The following table 1 shows the calculation of gaps in the Servqual analysis.

Table 1. The calculation results of SERVQUAL performance, importance, gap, and rank

Dimension	No.	Attribute	Performance	Importance	Gap	Rank
Tangible	T1	Workers use complete safety equipment	4.200	4.022	0.178	15
	T2	Workers are always alert and ready on the spot when needed	4.356	3.933	0.422	21
	T3	Completeness and readiness of work equipment according to the agreement	4.378	3.933	0.444	24
	T4	Cleanliness and comfort of the work environment	3.867	4.400	-0.533	5
	T5	Completeness of worker certification in terms of safety	3.111	4.178	-1.067	2
Reliability	R1	Conformity of the services provided with the details of the offer	3.378	4.467	-1.089	1
	R2	Reliability of workers in carrying out task instructions	4.378	4.178	0.200	16
	R3	Providing services according to technical specifications	4.400	4.244	0.156	13
	R4	Punctuality in completing work	3.756	4.267	-0.511	6
	R5	Workmanship accuracy by workers without making mistakes	4.244	4.356	-0.111	9
Responsiveness	S1	The speed of workers in responding to job requests	3.644	4.511	-0.867	4
	S2	Quick in providing critical information	3.600	3.556	0.044	11
	S3	Workers immediately provide assistance when asked for assistance	4.400	3.978	0.422	22
	S4	Quick in providing solutions	4.289	4.067	0.222	17
	S5	The readiness of workers to respond to emergency requests	4.111	4.400	-0.289	8
Assurance	A1	Workers are always careful in carrying out work	4.422	4.200	0.222	17
	A2	Employees have the knowledge and skills required by the job	4.333	4.111	0.222	17
	A3	Informing the progress and evaluation of each work result	3.422	4.311	-0.889	3
	A4	The level of service provided after the job is done	4.422	4.400	0.022	10
	A5	Provide a guarantee for the product or service provided	4.089	4.489	-0.400	7
Empathy	E1	Give special attention to every job request	4.289	3.711	0.578	25
	E2	Workers' concern for complaints from company partners	3.711	3.556	0.156	13
	E3	Workers' understanding of the needs of work	4.600	4.156	0.444	23
	E4	Feeling safe while dealing (service) with the company	4.311	4.000	0.311	20
	E5	The company is fully responsible for the results of the treatment	3.733	3.578	0.156	12

Table 1 shows that nine service attributes have negative gaps in the following order: 1) Conformity of the services provided with the details of the offer, 2) Completeness of worker certification in terms of safety; 3) Informing the progress and evaluation of each work result; 4) The speed of workers in responding to job requests; 5) Cleanliness and comfort of the work environment; 6) Punctuality in completing work; 7) Providing a guarantee for the product or service provided; 8) The readiness of workers to respond to emergency requests; and 9) Workmanship accuracy by workers without making mistakes. A gap with a negative value indicates that the customer is not satisfied with the service attributes mentioned.

The average gap for each dimension is calculated by adding up the gap values in each dimension and then dividing it by the number of attributes in each dimension, the calculation of which is shown in Table 2. Of the five existing Servqual dimensions, it has not satisfied PLP customers because the average gap value obtained is less than 1 or has a negative value. These results indicate that PLP cannot meet the wishes of customers. To improve the quality of services that have been lacking so far, it is necessary to plan or re-evaluate the efforts that need to be made.

Table 2. The average gap for each dimension

No.	Dimension	Importance	Performance	Gap
1	Tangible	4.093	3.982	-0.111
2	Reliability	4.182	3.818	-0.364
3	Responsiveness	4.231	3.822	-0.409
4	Assurance	4.293	3.827	-0.467
5	Empathy	4.267	3.804	-0.462
	Mean	4.213	3.851	-0.363

3.3. Importance Performance Analysis (IPA) Results Analysis

This IPA analysis is used to obtain the factors that influence the results obtained from the service quality dimension. The performance and importance data in Table 1 are then used in making a Cartesian diagram regarding placement position data based on importance-performance analysis.

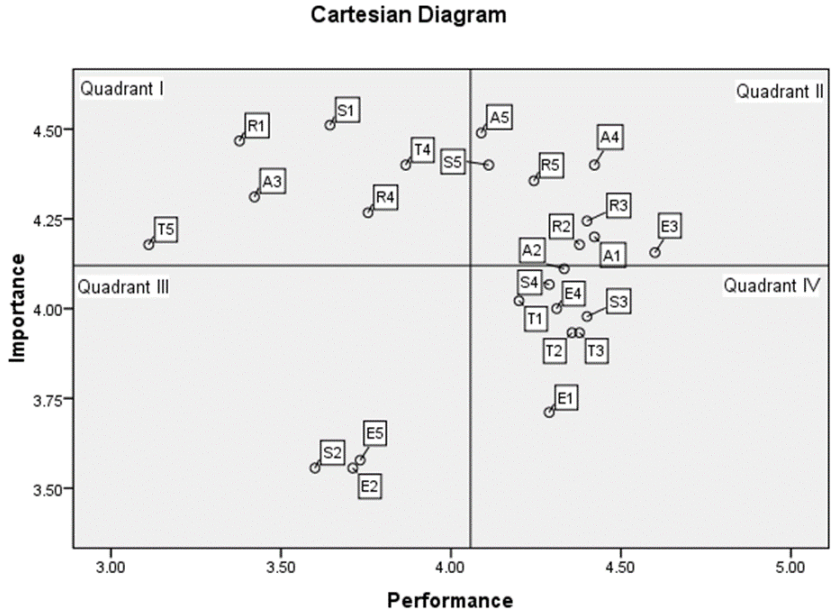

Figure 1. The Cartesian Diagram of IPA Analysis

The data processing results in Figure 1, show that IPA analysis consists of four quadrants.

- Quadrant I is an area that contains attributes that are considered important by customers, but in reality, these attributes are not as expected; in other words, the level of customer satisfaction is still very low. In quadrant, I, namely high priority, are attribute numbers T4, T5, R1, R4, S1, and A3.
- Quadrant II is where the traits that the customer considers important are located, and because these attributes are based on how the customer feels, there is a comparably higher level of satisfaction. Quadrant II, which is kept, is on attribute numbers R2, R3, R5, S5, A1, A4, A5, and E3.
- Quadrant III is an area that contains attributes that are considered less valuable by customers, and in fact, the performance is less special. In quadrant III, namely low priority, are attribute numbers S2, E2, and E5.
- Quadrant IV is the area of attributes that are considered less important by customers and are felt to be redundant. As for quadrant IV, or excess, the attribute is at numbers T1, T2, T3, S3, S4, A2, E1, and E4.

Of the four attributes, the quadrant taken as an attribute of customer satisfaction is quadrant 1, namely the attribute number shown in Table 3, because quadrant 1 is a quadrant with high priority. Customers place a high value on the traits in Quadrant 1, but in reality, these attributes are not as expected, or the level of customer satisfaction is still very low. Therefore, in improving the quality of service at the PLP company's electrical maintenance service, we must use attributes in quadrant I that are considered important by customers to be prioritized. The company is always improving, which leads to better performance in this quadrant.

Table 3. The attributes in quadrant 1 (high priority)

Quadrant	No	Attribute
Quadrant I (High Priority)	T4	Cleanliness and comfort of the work environment
	T5	Completeness of worker certification in terms of safety
	R1	Conformity of the services provided with the details of the offer
	R4	Punctuality in completing work
	S1	The speed of workers in responding to job requests
	A3	Informing the progress and evaluation of each work result

3.4. Kano model Analysis

The Kano model is used to determine how well a product or service can satisfy customer needs. Before determining the Kano category for each service attribute, a summation is made for each Kano category in each attribute, namely Q = Questionable, R = Reverse, A = Attractive, I = Indifferent, O = One-Dimensional and M = Must-Be. Table 4 shows the number of Kano categories in each attribute for all respondents and the results of the Kano category obtained using the Blauth formula.

Table 4. The calculation results of the Kano analysis

No	No.	Number of Kano						Total	Better	Worse	Category
		O	A	M	I	R	Q				
1	T1	19	6	18	2	0	0	45	0.556	0.822	M
2	T2	19	4	18	4	0	0	45	0.511	0.822	M
3	T3	21	7	12	5	0	0	45	0.622	0.733	A
4	T4	20	7	10	8	0	0	45	0.600	0.667	A
5	T5	19	3	21	2	0	0	45	0.489	0.889	M
6	R1	22	1	21	1	0	0	45	0.511	0.956	M
7	R2	20	8	8	9	0	0	45	0.622	0.622	A
8	R3	24	4	13	4	0	0	45	0.622	0.822	O
9	R4	21	7	12	5	0	0	45	0.622	0.733	A
10	R5	19	9	13	4	0	0	45	0.622	0.711	A
11	S1	25	3	14	3	0	0	45	0.622	0.867	O
12	S2	23	3	17	2	0	0	45	0.578	0.889	M
13	S3	25	3	15	2	0	0	45	0.622	0.889	O
14	S4	22	5	16	2	0	0	45	0.600	0.844	O
15	S5	19	9	12	5	0	0	45	0.622	0.689	A
16	A1	22	6	14	3	0	0	45	0.622	0.800	A
17	A2	25	4	14	2	0	0	45	0.644	0.867	O
18	A3	20	2	21	2	0	0	45	0.489	0.911	M
19	A4	20	7	9	9	0	0	45	0.600	0.644	A
20	A5	22	7	9	7	0	0	45	0.644	0.689	A
21	E1	22	3	18	2	0	0	45	0.556	0.889	M
22	E2	20	6	17	2	0	0	45	0.578	0.822	M
23	E3	20	3	19	3	0	0	45	0.511	0.867	M
24	E4	23	2	18	2	0	0	45	0.556	0.911	M
25	E5	20	7	11	7	0	0	45	0.600	0.689	A

Based on data processing using the Kano model,

- Must-Be Attribute: This is a highly prioritized customer criterion that is expected to be provided. If these criteria are met, the general response is likely to remain neutral but can lead to customer dissatisfaction if product specifications are not met. Consumers view the "must-have" attributes as absolute requirements. The attributes included in this category are T1, T2, T5, R1, S2, A3, E1, E2, E3, and E4.
- One-Dimensional Attributes: These are attributes that tend to increase customer satisfaction when they are met and increase dissatisfaction when they are not. The result of this attribute is positive or negative feedback about the service provided, which is neutral and negative in the first case. In the one-dimensional category of performance needs, customer satisfaction is related to service performance. The higher the attribute indicator, the higher the client

satisfaction, for example, with the product warranty offered by a maintenance service company. If this situation is achieved, customer satisfaction will increase rapidly, but if there is no product guarantee, customer satisfaction will decrease rapidly. Attributes included in this category are R3, S1, S3, S4, and A2.

- Attractive Attributes: These are the attributes that result in customer feedback being positive or neutral. Generally, customers do not expect to have them, and if such quality or service is provided, it tends to satisfy customer expectations. The absence of this attribute does not have a negative impact on customers. Attributes included in this category are T3, T4, R2, R4, R5, S5, A1, A4, A5, and E5.

From the results of the calculations that have been done, the better and worst values are processed into Cartesian diagrams according to the canoe model category, as shown in Figure 2.

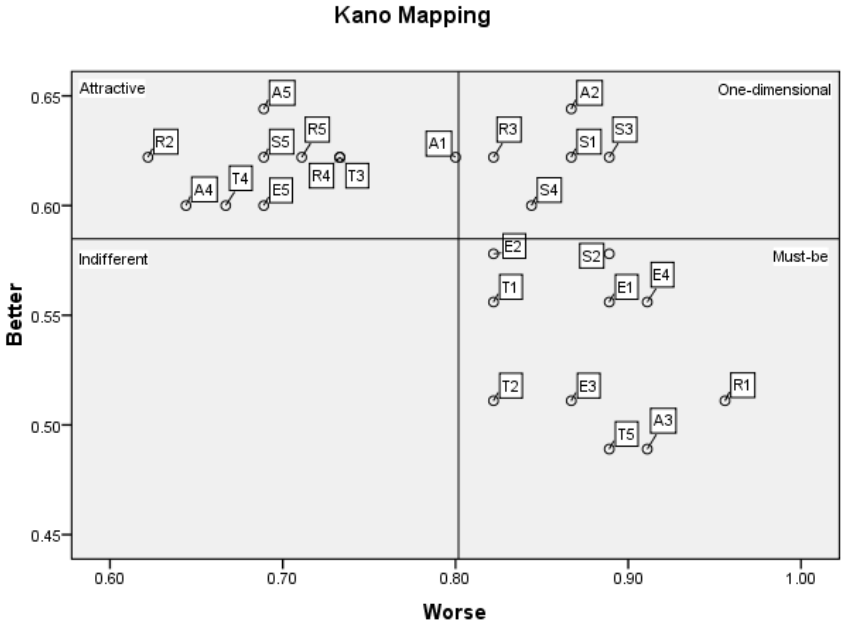

Figure 2. The Cartesian Diagram of Kano Analysis

3.5. Service Improvement Recommendations

Recommendations for service improvement are based on the largest gap value, high priority attribute, and important attribute for customers. This recommendation is analyzed based on the attributes of quadrant one through IPA analysis and is included in the one-dimensional, must-be, and attractive categories, which will be the PLP company's top improvement objective. The following is an analysis of service improvement recommendations for this study.

Table 5. Service Attribute Improvement Recommendations

No	Attribute	Gap Servqual	IPA Cat.	Kano Cat.	Recommendations	Strength & Weakness
T4	Cleanliness and comfort of the work environment	-0.533	Quadrant I (High priority)	A	Implementing 5R	(+) Engagement between the company and employees becomes strong (+) Capable of improving employee retention (+) The company's long-term profitability (-) Expensive training costs (-) It takes seriousness from employees so that the results of the training can be achieved
T5	Completeness of worker certification in terms of safety	-1.067	Quadrant I (High priority)	A	Conducting employee training	(+) Increasing customer satisfaction due to a comfortable place and environment. (+) Increased productivity due to more efficient workplace arrangements. (+) Increase comfort. (-) Employees do not comply with the implementation of the 5S program (-) There is no written regulation regarding the implementation of 5R
R4	Punctuality in completing work	-0.511	Quadrant I (High priority)	A		
S1	The speed of workers in responding to job requests	-0.867	Quadrant I (High priority)	O		
R1	Conformity of the services provided with the details of the offer	-1.089	Quadrant I (High priority)	M	Hold regular coordination meetings	(+) Assess the work done (+) Make employees aware of their jobdesk magic (+) Resolving company problems (+) Increasing customer trust
A3	Informing the progress and evaluation of each work result	-0.889	Quadrant I (High priority)	M		

3.6. Limitations and Scope for Further Research

There are several limitations to be further studied. First, the perspectives of PLP company customers are used to estimate subjective service quality parameters. Customer demographics have an impact on user perception data. The study's discussion of the subjective service quality aspects is therefore restricted to one PLP company. Electrical and lighting maintenance providers will not always provide the same level of service. Future research could collect data from a larger and more diversified number of samples from various geographic locations. Such studies could assist in evaluating the opinions and expectations of various stakeholders regarding the experience, sensitivity, and service quality of electrical and lighting maintenance companies. Additional research may also concentrate on aspects such as client confidence, customer loyalty, etc.

4. Conclusion

Based on the result and the discussion above, the conclusions for this research are:

- The gap score for all quality dimensions was -0.363, reflecting poor service quality, despite variances in particular quality characteristics. For instance, gap scores for Reliability, Responsiveness, Assurance, Empathy, and Tangibles were -0.364, -0.409, -0.467, -0.462, and -0.111.

- Integration of Service quality, Importance Performance Analysis (IPA), and Kano methods are used to determine which attributes should be prioritized that need to improve. The results of this study found six priority attributes, including cleanliness and comfort of the work environment, completeness of worker certification in terms of safety, conformity of the services provided with the details of the offer, punctuality in completing work, the speed of workers in responding to job requests, and informing the progress and evaluation of each work result.

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