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ORIGINAL ARTICLE

Customer satisfaction in quality measurement services: A hybrid customer satisfaction analysis

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ABSTRACT – Developments in the business world have always experienced rapid growth to date, and both businesses are engaged in services or non-service fields. The development of an economy accompanied by the development of technology and science creates increasingly fierce competition, especially in quality measurement services. Therefore, this study presents a Fuzzy-SERVQUAL, IPA, and PGCV Index method, which adequately assists practitioners in identifying critical service attributes. Satisfaction analysis used the Fuzzy-SERVQUAL method to obtain a defuzzification value where the results are inputs for the IPA method. The IPA method found that the weaker attributes of the quality measurement services are prices that need to be linear with the quality and should promptly resolve problems. The PGCV Index method ranks the service attributes prioritized to improve efforts to improve the quality of service. This framework enables quality measurement services to identify their current quality level and focus on weaker attributes to improve their service quality.

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INTRODUCTION

The development of the business world is constantly experiencing very rapid growth until now, either business engaged in services or non-services. In economic development and also technological developments can lead to intense competition. Business development in inspection, testing, and certification services is increasingly tight and competitive in terms of service, price, and location. The company must satisfy its customers by creating quality products or services and following customers' expectations. The quality of service is an expected excellence level to fulfill the customer's expectation to feel satisfied. In recent years, it can be observed that the customers are becoming more and more sensitive towards the service quality. PT. X is the first inspection company in Indonesia built by the State of the Republic of Indonesia or can be said to be a company that belongs to a State-Owned Enterprise. Therefore, assessing the service quality would help the company identify improvement areas and create a competitive advantage [1].

Quality itself can be interpreted as an achievement by the characteristics related to meeting the requirements. The quality of service is one of the crucial factors that support decision-making in choosing which part to be improved. According to [2], service quality is diversity among customers' anticipations and their service comprehension. If performance exceeds the anticipated rate, the comprehended quality will be above the satisfactory rate; customer satisfaction appears. There has been much proof illustrating that a linear relationship exists between customer satisfaction and service quality. The idea of service quality has been discussed for a very long period by experts in the field and by the practitioners [3]. Often the five dimensions: reliability, responsiveness, assurance, empathy, and tangibles are used to define the service quality gap. This gap is based on the difference between a customer's expectations of a service and the perception of the delivered service. The interpretation of service quality may be the level of customer satisfaction. This level of customer satisfaction can be obtained from comparing the type of service that the customer receives with the type of service that the customer expects [4]. Good quality service can be seen from the service that can satisfy customers and follow customers' expectations. However, if the service is not following customer expectations, the service is the poor quality of service. In addition, PT. X also sees its employees as valuable assets to always get more attention in improving the quality of service. By improving the quality of service will be an advantage for the company. Companies with good value in customers' eyes can be interpreted that the customer will always be loyal and regular and will always judge the company's exemplary services, such as speed and accuracy, manners, and sympathy to customers.

The quality of service is a measure of service regarding the difference between consumer expectations and their performance. Servqual techniques can determine how much the customer expects to be with the customer's expectations for the service received. Quality in Service Quality measurement (SERVQUAL) has five dimensions, including Tangibles (direct proof), Reliability, Responsiveness, Assurance (guarantee), and Empathy (empathy). These five dimensions must run well in order for customer satisfaction to be fulfilled.

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PT. X also has several rival companies engaged in the same inspection, testing, and certification services. However, judging from the superiority data obtained that in 2019 ago PT. X won the best SOE Award. It makes PT. X should be more concerned and improve the quality of service owned to attract more customers and make customers feel comfortable and satisfied with the service provided by the company. Judging from the percentage of customer satisfaction before, especially in some portfolios, customers get less maximum results than other portfolios. Therefore, it makes the overall total percentage of the customer satisfaction index decrease. The percentage of customer satisfaction is seen based on the analysis of the quality of the company's service to its customers. If the customer is not satisfied with the service obtained, there is a poor quality of service for the customer to feel uncomfortable. The following is a percentage chart of the customer satisfaction index by portfolio in 2019.

Based on the data obtained by researchers, it is known that some portfolios are lower percentage than other portfolios, such as AEBT (Asset, New and Renewable Energy) by 81%, SERCO (Certification and Eco framework) by 85%, KSP (Commodity & Trading Solutions) by 86% and HMPM (Upstream Oil and Gas Products) by 83%. Therefore, research is conducted on customer satisfaction by analyzing the quality of the company's service. Analysis of the quality of service in this service company will be done using methods commonly used in handling cases related to customer satisfaction, the first with the fuzzy method. This method serves to remove the uncertain value from the questionnaire value.

The membership function used in this Fuzzy method is Triangular Fuzzy. Triangular Fuzzy is often used because it provides ease in a calculation and is more representative of an assessment. Furthermore, the output of the Fuzzy method will be the input on the Important Performance Analysis method. The IPA (Importance Performance Analysis) method aims to measure the relationship between customer perceptions and priorities for improving product or service quality, which is also known as quadrant analysis [5]. According to [6] applied the IPA to identify some improvement opportunities and applied exploratory factor analysis to identify the underlying environmental factors based on the importance ratings. The IPA method is a method derived from the concept of Servqual. This Servqual concept translates what customers want and is measured by what the company must do to produce quality products, whether they realize it or not. The system's service quality will be essential for achieving a successful implementation and satisfying customers [7]. The IPA method has also been widely used in various fields, especially in the field of services. Importance–Performance Analysis (IPA) is a simple and valuable technique for identifying those attributes of a product or service that are most in need of improvement or that are candidates for possible cost-saving conditions without significant detriment to overall quality. The IPA method can show the level of satisfaction and the level of customer interest in the company [8]. This method can be used to classify which gaps of attributes should be retained, improved, do not need to be upgraded, and be derived. However, this approach is often used without adequate consideration of its validity or reliability [9].

The Potential Gain Customer Value (PGCV) Index method completes the importance and performance analysis results. It is less able to recommend an improvement that can be the most critical priority. It is necessary to use other analysis tools to gain PGCV Index. One of the problems with the IPA method is selecting an optimal cutting point to classify work scores and importance values so that a more accurate method is needed to establish the priority of improving each attribute. With the usage of the PGCV Index, it can be identified what attributes that needs to be first improved [10]. The purpose of the research is to know the level of interest and customer satisfaction to PT. X, so that later attributes that affect the quality of service and require improvement can be obtained.

RELATED WORKS

Analysis of service quality at this service company will be carried out using the methods commonly used in handling cases related to customer satisfaction, the first with the Fuzzy method where this method serves to eliminate the uncertain value of the questionnaire. The membership function used in this fuzzy method is triangular fuzzy. Triangular Fuzzy is often used because it provides convenience in a calculation and is more representative of an assessment. Furthermore, the output of the Fuzzy method will be the input to the Important Performance Analysis method. The Importance Performance Analysis (IPA) method aims to measure the relationship between customer perceptions and priorities for improving product or service quality, also known as quadrant analysis [8]. The IPA method is a method derived from the Servqual concept. This Servqual concept translates what customers want and is measured by what the company must do to produce a quality product, whether realized or not [9]. The IPA method has been widely used in various fields, especially in the service sector. The IPA method can show the level of satisfaction and the level of customer interest in the company. The results of this method will then classify which attributes should be maintained, should be increased, should not be increased, and should be lowered.

The PGCV Index method is used to complete the results of the importance and performance analysis. This cannot recommend an improvement that can be the top priority, so it is necessary to use another analytical tool through the PGCV Index figure. One of the problems with the IPA method is the basis for selecting an optimal intersection point for classifying performance scores and importance values, so a more accurate method is needed to prioritize the improvement of each attribute. By using the PGCV Index, it can be seen the attributes that needs to be improved first.

METHODS

The research method used in this study is the quantitative method. Sampling techniques in this study used non-probability sampling. The non-probability sampling technique to be used is purposive sampling. Based on the Slovin

Method, a minimum sample of 79 respondents is needed to meet the needs of this study. However, in this study, 150 respondents were used. Data processing techniques are used using questionnaires, interviews, and literature studies. Data analysis techniques are used through validity and reliability tests. In this analysis stage, analysis of respondent characteristics and analysis of data processing results using Fuzzy, Importance Performance Analysis (IPA), and PGCV Index methods were conducted.

RESULTS

Calculation of Service Attribute Performance with Fuzzy-SERVQUAL Method

The following results from the recapitulation of the defuzzification calculation based on the processing of the satisfaction level questionnaire (Table 1).

Table 1. Results of Recapitulation of Defuzzification Calculation of Customer Satisfaction Level Questionnaire.

No	Attribute Statement	c	a	b	Defuzzification
1	Company employees have integrity	9.720	11.220	12.720	11.970
2	The company provides appropriate services.	9.347	10.847	12.347	11.597
3	The prices match the quality and benefits.	9.480	10.980	12.480	11.730
4	Employees of the company look neat and convincing.	9.600	11.100	12.600	11.850
5	Employees can provide advice according to the problems faced.	9.400	10.900	12.400	11.650
6	Adequate knowledge in explaining products/services.	9.680	11.180	12.680	11.930
7	Employees can solve problems.	9.440	10.940	12.440	11.690
8	Employees of the company can understand the needs of customers.	9.680	11.180	12.680	11.930
9	Maintain an excellent cooperative relationship even if the work is completed.	9.747	11.247	12.747	11.997
10	Provide feedback and service to problems facing customers in a focused manner.	9.627	11.127	12.627	11.877
11	The company resolved the issue promptly.	9.573	11.073	12.573	11.823
12	Fast and responsive in dealing with customer needs.	9.600	11.100	12.600	11.850
13	Provide accurate and valid work results according to specifications.	9.493	10.993	12.493	11.743
14	Able to identify problem-solving correctly.	9.467	10.967	12.467	11.717
15	The company guarantees the confidentiality and security of the data of the work.	9.840	11.340	12.840	12.090
16	The company guarantees the results of the work.	9.680	11.180	12.680	11.930
17	Employees help and serve customers kindly and politely.	9.773	11.273	12.773	12.023
18	Employees are easy to contact if there are problems.	9.667	11.167	12.667	11.917
19	Employees communicate well in dealing with problems faced by customers.	9.680	11.180	12.680	11.930

Table 2 indicates the result of recapitulation of defuzzification calculations based on the processing of importance-level questionnaires.

Table 2. Results of Recapitulation of Defuzzification Calculation of Customer Interest Level Questionnaire.

No	Attribute Statement	c	a	b	Defuzzification
1	Company employees have integrity.	10.027	11.527	13.027	12.277
2	The company provides appropriate services.	9.960	11.460	12.960	12.210
3	The prices match the quality and benefits.	10.040	11.540	13.040	12.290
4	Employees of the company look neat and convincing.	10.000	11.500	13.000	12.250
5	Employees can provide advice according to the problems faced.	9.907	11.407	12.907	12.157

6	Adequate knowledge in explaining products and services.	10.053	11.553	13.053	12.303
7	Employees can solve problems.	9.960	11.460	12.960	12.210
8	Employees of the company can understand the needs of customers.	10.053	11.553	13.053	12.303
9	Maintain an excellent cooperative relationship even if the work is completed.	10.133	11.633	13.133	12.383
10	Provide feedback and service to problems facing customers in a focused manner.	9.987	11.487	12.987	12.237
11	The company resolved the issue promptly.	10.027	11.527	13.027	12.277
12	Fast and responsive in dealing with customer needs.	9.947	11.447	12.947	12.197
13	Provide accurate and valid work results according to specifications.	9.933	11.433	12.933	12.183
14	Identify problem-solving appropriately.	9.960	11.460	12.960	12.210
15	The company guarantees the confidentiality and security of the data of the work.	10.067	11.567	13.067	12.317
16	The company guarantees the results of the work.	9.987	11.487	12.987	12.237
17	Employees help and serve customers kindly and politely.	10.093	11.593	13.093	12.343
18	Employees are easy to contact if there are problems.	4.177	5.677	7.177	6.427
19	Employees communicate well in dealing with problems faced by customers.	4.176	5.676	7.176	6.426

Table 3 shows the recapitulation of defuzzification calculations based on the processing of expectation-level questionnaires.

Table 3. Results of Recapitulation of Customer Expectation Level Defuzzification Calculation.

No	Attribute Statement	c	a	b	Defuzzification
1	Company employees have integrity.	9.733	11.233	12.733	11.983
2	The company provides appropriate services.	9.467	10.967	12.467	11.717
3	The prices match the quality and benefits.	9.613	11.113	12.613	11.863
4	Employees of the company look neat and convincing.	9.653	11.153	12.653	11.903
5	Employees can provide advice according to the problems faced.	9.493	10.993	12.493	11.743
6	Adequate knowledge in explaining products/services.	9.693	11.193	12.693	11.943
7	Employees can solve problems.	9.493	10.993	12.493	11.743
8	Employees of the company can understand the needs of customers.	9.707	11.207	12.707	11.957
9	Maintain a good working relationship even after the job is done.	9.773	11.273	12.773	12.023
10	Provide feedback and service to problems facing customers in a focused manner.	4.185	5.685	7.185	6.435
11	The company resolved the issue on time.	4.183	5.683	7.183	6.433
12	Fast and responsive in dealing with customer needs.	4.182	5.682	7.182	6.432
13	Provide accurate and valid work results according to specifications.	4.184	5.684	7.184	6.434
14	Able to identify problem-solving correctly.	4.181	5.681	7.181	6.431
15	The company guarantees the confidentiality and security of the data of the work.	4.184	5.684	7.184	6.434
16	The company guarantees the results of the work.	4.181	5.681	7.181	6.431
17	Employees help and serve customers kindly and politely.	4.180	5.680	7.180	6.430
18	Employees are easy to contact if there are problems.	4.182	5.682	7.182	6.432
19	Employees communicate well in dealing with problems faced by customers.	4.183	5.683	7.183	6.433

Calculation of Service Attribute Performance with Importance Performance Analysis (IPA) Method

In quadrant mapping using the IPA method, performance values are mapped as X axes, while Importance values are mapped with the Y-axis. The following is the result of quadrant mapping using the Importance Performance Analysis (IPA) method. The following results from the quadrant mapping diagram from Importance Performance Analysis (IPA) method processing.

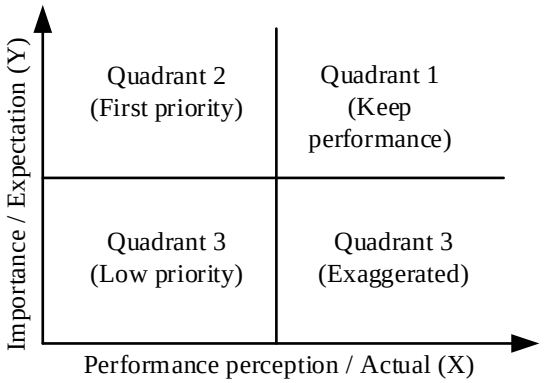

Figure 1. Quadrant Mapping Result Diagram with IPA Method

Furthermore, after obtaining the results of quadrant mapping, a comparison of the total score and average score of Satisfaction Level (Performance) and Importance Level (Importance) is made, as shown in Table 4.

Table 4. Recapitulation of Total Score Comparison Results and Average Score

No.	Attribute Statement	Level of Satisfaction		Level of Importance	
		Total Score [Xi]	Average Score [Yi]	Total Score [Xi]	Average Score [Yi]
1	Company employees have integrity.	804	5.360	827	5.513
2	The company provides appropriate services.	776	5.173	822	5.480
3	The prices match the quality and benefits.	786	5.240	828	5.520
4	Employees of the company look neat and convincing.	795	5.300	825	5.500
5	Employees can provide advice according to the problems faced.	780	5.200	818	5.453
6	Adequate knowledge in explaining products/services.	801	5.340	829	5.527
7	Employees can solve problems.	783	5.220	822	5.480
8	Employees of the company can understand the needs of customers.	801	5.340	829	5.527
9	Maintain an excellent cooperative relationship even if the work is completed.	806	5.373	835	5.567
10	Provide feedback and service to problems facing customers in a focused manner.	797	5.313	824	5.493
11	The company resolved the issue promptly.	793	5.287	827	5.513
12	Fast and responsive in dealing with customer needs.	795	5.300	821	5.473
13	Provide accurate and valid work results according to specifications.	787	5.247	820	5.467
14	Able to identify problem-solving correctly.	785	5.233	822	5.480
15	The company guarantees the confidentiality and security of the data of the work.	813	5.420	830	5.533
16	The company guarantees the results of the work.	801	5.340	824	5.493
17	Employees help and serve customers kindly and politely.	{114.45.00	0,5298611	120.06.00	0,5583333

18	Employees are easy to contact if there are problems.	115.08.00	0,5361111	121.04.00	0,5618056
19	Employees communicate well in dealing with problems faced by customers.	117	0,5416667	121	0,5604167

After calculating the score and average score at the Satisfaction Level and Importance Level, the data is used to obtain the Conformity Level data of each Attribute Statement. Table 5 indicates the results of data recapitulation of conformity levels.

Table 5. Compatibility Level Recapitulation

No.	Attribute Statement	Total Score of Satisfaction Level [Xi]	Total Score of Importance Level [Yi]	Conformity Level
1	Company employees have integrity.	804	827	0,6750
2	The company provides appropriate services.	776	822	0,6556
3	The prices match the quality and benefits.	786	828	0,6590
4	Employees of the company look neat and convincing.	795	825	0,6694
5	Employees can provide advice according to the problems faced.	780	818	0,6625
6	Adequate knowledge in explaining products/services.	801	829	0,6708
7	Employees can solve problems.	783	822	0,6618
8	Employees of the company can understand the needs of customers.	801	829	0,6708
9	Maintain an excellent cooperative relationship even if the work is completed.	806	835	0,6701
10	Provide feedback and service to problems facing customers in a focused manner.	797	824	0,6715
11	The company resolved the issue promptly.	793	827	0,6660
12	Fast and responsive in dealing with customer needs.	795	821	0,6722
13	Provide accurate and valid work results according to specifications.	787	820	0,6667
14	Able to identify settlement problems appropriately.	785	822	0,6632
15	The company guarantees the confidentiality and security of the data of the work.	813	830	0,6806
16	The company guarantees the results of the work.	801	824	0,6750
17	Employees help and serve customers kindly and politely.	808	832	0,6743
18	Employees are easy to contact if there are problems.	800	829	0,6701
19	Employees communicate well in dealing with problems faced by customers.	801	826	0,6736

Based on the recapitulation of the order of Conformity Level above, obtained Attribute Statement at number 2 (The Company provides appropriate services) is the order of the slightest value, where the attribute is the most priority attribute to be improved. The above Conformity Level results determine the order of priority attributes that must be corrected first. Then, further processing is carried out using the PGCV Index method. The Conformity Level data will compare the priority sequence of attribute improvement between the IPA method and the PGCV Index method. This comparison is made to determine the selected attributes in priority in the IPA and PGCV Index methods. Moreover, sorting the priority of attribute improvements performed by the IPA method and the PGCV Index method can help final decision-making on attributes that must be prioritized to be corrected along with their order.

Determination of Priority Order of Service Improvement with PGCV Index Method

This PGCV Index calculation is the value used to determine the order of priority of each Attribute Statement. Then, the PGCV Index values in the Table 6 are sorted from the largest to the smallest values. In the PGCV Index method, if the attribute statement value is getting bigger, then the Attribute Statement is increasingly the priority for improvement. Here is the order of PGCV Index values ranging from the largest to the smallest.

Table 6. Order of PGCV Index Values from Largest to Smallest

No.	Attribute Statement	PGCV *Index*
2	The company provides appropriate services.	4,530
5	Employees are able to provide advice according to the problems encountered.	4,363
7	Employees are capable of problem solving.	4,274
14	Able to identify problem solving appropriately.	4,201
3	Prices are following the quality and benefits.	4,195
13	Provide accurate and valid work results according to specifications.	4,118
11	The company resolves problems promptly.	3,933
4	Company employees are neat and convincing.	3,850
12	Fast and responsive in dealing with customer needs.	3,831
10	Provide responses and services to problems faced by customers in a focused manner.	3,772
18	Employees are easy to contact if there is a problem.	3,684
6	Adequate knowledge in explaining products/services.	3,648
8	Company employees are able to understand customer needs.	3,648
19	Employees communicate well in dealing with problems faced by customers.	3,634
16	The company guarantees the results of the work.	3,626
1	Company employees have integrity.	3,529
9	Maintain a good working relationship even after the job is done.	3,488
17	Employees are helpful and serve customers in a friendly and courteous manner.	3,402
15	The company guarantees the confidentiality and security of work data.	3,209

DISCUSSION

Based on the results of the recapitulation of the PGCV Index value sequence above, it is obtained that the Attribute Statement at number 2 (the company provides appropriate services) is the most considerable PGCV Index value or can be interpreted as the most priority Attribute Statement to be corrected.

The grouping attribute categories are seen based on the results of defuzzification at the questionnaire level of importance and level of satisfaction. Then, the IPA method's results are arranged in the form of a diagram in which the X-axis in this diagram is the level of performance (satisfaction). The Y-axis shows the level of importance. Finally, based on mapping the IPA method using SPSS software, the 19 Attribute Statement quadrant diagrams were grouped on processing using the IPA method. Based on the mapping results, the following is a discussion for each quadrant in this study.

In quadrant, I (high priority) shows that service attributes in this quadrant have a high level of importance but produce a low level of satisfaction. The attributes in this quadrant are the top priority for immediate improvement to improve the quality of its service to customers and provide satisfaction to them. Based on the data processing results done using SPSS software for this IPA method, several attributes enter into this quadrant I, attribute 3 (the price that corresponds to quality and benefits) and attribute 11 (the company solves the problem promptly).

In attribute three, where the statement is Prices match the quality and benefits. Based on the results of the recapitulation of interest-level questionnaires, many customers think that price is essential. However, on the results

obtained at the satisfaction level regarding these attributes, customers are dissatisfied with the current price with the quality and benefits provided by the company. It inconveniences PT customers. X. Then, at attribute 11, the statement is that the company resolved the issue promptly. This attribute is considered essential to customers. It is resolving problems when not on time is a bad thing for customers. Based on the research results obtained, that time is significant, and the company's service in problem-solving promptly is still lacking, while customers need timely troubleshooting. Therefore, this still needs to be improved again so the company's service is even better and the customers are more comfortable than before.

In quadrant II (maintain) indicates that the attributes contained in this quadrant have a high level of importance and a low level of satisfaction. Therefore, the attributes in quadrant II need to be maintained so that the service does not decrease and can continuously satisfy customers and even future customers.

Quadrant III (low priority) consists of low importance attributes and a low level of satisfaction. The attributes in quadrant III need to be improved to improve the service and provide customer satisfaction and comfort, but those attributes are still classified as low priority. From the data processing results that have been done, several attributes go into quadrant III, namely.

Quadrant IV (Redundant) shows service attributes with a low level of importance but have a high level of satisfaction. Thus, it can be said that PT. X has maximized its performance, especially in the quality of service on these attributes. The attributes included in quadrant IV are attributed ten regarding the company providing responses and services to customers' problems in a focused manner and attribute 16, which states The Company guarantees the work results. However, it is good if the best service is also balanced with the attributes of service that still need to be maximized.

The priority of attribute statement improvement is obtained based on data processing results using the PGCV Index method. The following is the result of the priority sequence of attribute improvement with the PGCV Index method. It is done to make it easier to compare data processing and the IPA method with the PGCV Index method. The Attribute Statement below has been sorted from those with the highest PGCV Index values to the lowest ones.

Once the order of priority of service attribute improvement is obtained based on the PGCV Index method, the results can be compared to the diagrams produced by the previous IPA method. For example, in quadrant I of the IPA method, some attributes need to be prioritized for improvement. These attributes have been sorted from the lowest service quality to the highest in a row; it is numbers 3 and 11. Both attributes are also included in the order of priority improvements to calculations with the PGCV Index method. However, these attributes do not fall to the top of the PGCV Index method. It indicates that prioritizing improvements using the IPA and PGCV Index methods has differences. The difference is because the IPA method does not calculate the potential value of customer satisfaction, while the PGCV Index method calculates the value to determine the quality of service of each attribute. The customer satisfaction value on each attribute can currently be compared to the highest value achieved by each attribute. For example, the potential value of customer satisfaction is six as the highest value. It is because the highest scale used in the questionnaire is six, which represents Very Satisfied. The potential value of customer satisfaction is used to provide added value quality or profit, so it is essential to consider sorting the priority improvement of service attributes. Calculation results with IPA and PGCV Index methods produce attributes that need to be prioritized to be improved.

The methods used in this study have integration or relationship between each method. Where the three methods include the fuzzy-servqual method, IPA, and PGCV Index here is in order to maximize research on the quality of service in a field of service. This SERVQUAL method is used to apply the five dimensions of service quality owned by PT. X. Applying these five dimensions can help to focus more on each attribute that needs to be assessed. However, the SERVQUAL method itself still has drawbacks, namely, not considering the respondents' differences in views and opinions who gave the assessment. Meanwhile, assessment by SERVQUAL method is strongly influenced by different opinions from respondents. Therefore, making research very subjective.

Moreover, to overcome this subjectivity, the researchers used Fuzzy logic as a complement to SERVQUAL. Fuzzy's logic will mask the subjectivity of SERVQUAL and help this study find out the actual value of each attribute assessed. It is following the fuzzy-servqual concept.

In the Fuzzy-SERVQUAL method, the assumption of valuation is linear, meaning that customer satisfaction increases along with each existing service attribute's increasing level of fulfillment. Meanwhile, in the IPA and PGCV Index methods, the service's quality is considered by looking at the satisfaction level and the importance of an attribute.

Based on this, the integration of the Fuzzy-SERVQUAL, IPA, and PGCV Index will be beneficial in providing comparisons about the final result, namely the order of improvement of the attributes that the company will use. It will help the company determine which steps are best to improve its services' quality. In this study, the final result of Fuzzy-SERVQUAL is defuzzification which is done to obtain a single value that describes the value of service quality of an attribute. This defuzzification of importance, satisfaction and expectations becomes the input for the IPA method and PGCV Index. The IPA method is then used to group each attribute into four quadrants. Every service attribute that needs to be improved is the attribute that goes into quadrant I (top priority) because the level of importance is high, but the satisfaction level is precisely low. Any attributes that are in this quadrant will be the focus to be fixed. Although able to know the attributes that have good service, medium, and low. The IPA method also has a deficiency in which the basis of optimal cut-point selection to configure performance/service scores and interests are often different. Therefore, different classifications will lead to different suggestions. In addition, the IPA method also does not take into account the potential

value of customer satisfaction in its assessment. Therefore, another, more accurate method is needed to set the priority of improving each attribute.

Another method that can be used to cover the IPA method's weakness is the PGCV Index method. The PGCV Index method itself is a development of the IPA method. Therefore, this method can mask the weaknesses of the IPA method itself. In this PGCV Index method, potential customer values are also taken into account, giving a clear order of key priority attributes that must be improved. By using the PGCV Index method, it can be known the order of priority of attribute improvement. Attributes that need to be improved will be sorted into priorities to prevent customers from moving to other competitors because their primary needs are not met, and they feel dissatisfied or uncomfortable with the services received by the company.

When viewed from the data processing methods that have been done, there is a difference in the order of priority attributes of service quality resulting from the method. Each method covers the other's weaknesses. Table 7 shows a recapitulation of the advantages and disadvantages of each method used in this study.

Table 7. Comparison Recapitulation of Advantages and Disadvantages of Methods

	Method		
	Fuzzy-SERVQUAL	**IPA**	**PGCV Index**
Advantage	Has five dimensions of service quality that can be used to measure the quality of service. Can be known what is the actual value of satisfaction and interests provided by consumers in the range of Likert scales used.	It can group attributes as a top priority or not prioritized for improvement.	It can provide an exact order of attribute improvement priorities, as it considers the potential value of customer satisfaction.
Deficiency	Unable to the group and sort attributes as the top priority for improvement.	It does not have a dimension of service quality that can measure the quality of service. Cannot provide a correct order of attribute improvement priority, as it does not consider the potential value of customer satisfaction.	It does not have a dimension of service quality that can measure the quality of service. Cannot tell if an attribute has satisfied its customers or not because it sorts attributes by priority only.

Furthermore, after obtaining the order of attributes prioritized according to sequencing using the previous IPA method and PGCV Index, the proposal or advice given to the company to the attributes that are the priority is a must. However, the stages of implementation of these proposals and suggestions cannot be done directly at PT. X is due to the Covid-19 pandemic and large-scale social restrictions, where researchers can only give proposals and suggestions to companies online. Based on data obtained from the company, there are complaints from customers that are mainly related to the implementation and delivery of work results, where complaints are 49%. The complaints given by respondents related to delivering work results related to resolving customer problems are not timely. In these circumstances, the company must maximize the employees' performances with existing employees without increasing employees. Therefore, the company can make several considerations; namely, the company can evaluate the employees related to their performance so far and maximize the performance of employees to be more effective and efficient again. Then, the following priority scale in quadrant III is the attributes that become a low priority. The attributes included in this quadrant are attributes that do not need to be given more attention, but the company still has to maintain and improve the service not to decrease.

CONCLUSION

Based on the research that has been done, several conclusions have been obtained based on the research problems discussed. Some of the service attributes used are obtained based on customers who want satisfactory and maximum service quality in any way. The hybrid analysis of service attributes can cover the shortcomings of each method by integrating the Fuzzy-SERVQUAL, IPA, and PGCV Index methods. Two service attributes fall into quadrant I in the IPA method as a top priority for improvement. Furthermore, the order of prioritized attributes for improvement is carried out using the PGCV Index method. The priority order of the service attributes is seen based on the results of the PGCV Index value from the largest to the smallest value. So that the proposals or suggestions are given to PT. X will be

helpful to improve service quality. Some attributes have similarities because each attribute is interconnected with one another.

Research suggestions for this study, both for the company and for further research, are as follows. Take several actions, such as evaluating each existing service proposal to see the quality of service at PT. X does not decrease. So that further research is expected to be able to develop other service quality attributes and use the latest research methods in measuring service quality in the service sector to compare the research results obtained.

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