Analysis of Customer Satisfaction Towards Internet Network Services Quality of XL Axiata During Covid-19 Pandemic in West Java

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Abstract:- Customer satisfaction is the most important thing for service providers, such as mobile operators. Where customer satisfaction is the result of how the quality of service providers are provided to customers. The purpose of this study is to analyze the level of customer satisfaction with the quality of XL Axiata internet network services in the West Java region during the Covid-19 pandemic and to find out whether there are things from the quality of internet network services provided by XL Axiata that need to be improved from the results of customer assessment.

This type of research is descriptive research with a quantitative approach. The method used to determine customer satisfaction uses the SERVQUAL and Importance-Performance Analysis (IPA) methods to determine the characteristics of the quality of services provided by XL Axiata. Data collection used a questionnaire distributed to XL Axiata internet network subscribers in West Java with a sample of 400 people.

The result of this study is that the level of customer satisfaction is at a moderate level which means that customers are quite satisfied with the quality of XL Axiata internet network services in West Java during the Covid-19 pandemic, and it is necessary to improve service quality based on the analysis that has been carried out.

Keywords:- Customer Satisfaction; Service Quality; Internet Network; Importance-Performance Analysis (IPA); West Java.

I. INTRODUCTION

During the Covid-19 pandemic, the internet can be said to be the most important means for society. Because people cannot do activities outside the home, almost community activities are carried out in their respective residences in a virtual way, be it work so that the term work from home is created, school so that the term virtual learning is created or to just interact with each other. Thus, cellular operators in Indonesia are competing to improve the quality of their internet networks, such as operators adding BTS to expand their internet networks during the Covid-19 pandemic (2020-2021).

According to one news media source in Indonesia, there are two operators, Telkomsel operators recorded to have 169.026 BTS in Q1 2020 and in Q1 2021 it increased to 183.913 and XL Axiata operators were recorded to have 97.717 BTS in Q1 2020 and in Q1 2021 it increased to 109.981[1]. XL Axiata has also been consistent in maintaining or improving services regarding its internet network during the Covid-19 pandemic, as evidenced by the report on cellular network experience from OpenSignal in 2020-2022 [2]. Based on the report, XL Axiata has always been ranked second in the category of download speed experience and 4G network coverage in Indonesia compared to operators in Indonesia, but the score from each year always increases. Not only that, based on the same report from OpenSignal, XL Axita clearly continues to strive to improve its internet network services, namely in 2022 XL Axiata will be ranked first in the category of download speed experience and video streaming experience.

Customer satisfaction is the most important thing for service providers, such as mobile operators. Where customer satisfaction is the result of how the quality of service providers are provided to customers. Service quality is the ability of a service provider company to retain its customers[3]. The value of the customer will be a reference for the service provider company to determine the steps in maintaining or improving the quality of service owned by the service provider company either for all sectors or only a few sectors in a service.

In the data owned by nPerf in November 2022, Java Island is the largest distribution of subscribers for cellular operators in Indonesia, including XL Axiata operators [4]. XL Axiata customers in Java Island have a distribution of ±26.000.000 subscribers. West Java Province is the province with the largest number of subscribers for XL Axiata in Java, 5.900.000 subscribers.

Judging from the phenomenon described earlier, during the Covid-19 pandemic in Indonesia, one of the favorite operators in Indonesia in this case XL Axiata continues to improve its internet network services until it can finally become the first-ranked operator in 2022 in terms of download speed experience and *streaming* experience video. However, it is necessary to analyze from the customer side to find out how XL Axita's customer satisfaction level with internet network services continues to be improved by XL Axita. Also, from the analysis, it will be known which sectors whose services need to be reviewed by XL Axiata to satisfy its

customers. Because the West Java region is the largest distribution of customers from XL Axiata, XL Axiata customers in the West Java region will be the object of research to be able to represent all customers from XL Axiata.

Based on the description above, researchers are interested in conducting research on "Analysis of Customer Satisfaction Towards Internet Network Services Quality of XL Axiata During the Covid-19 Pandemic in West Java". The results of the study will show the level of customer satisfaction with the quality of internet network services from XL Axiata in West Java during the Covid-19 pandemic and is expected to be a reference for XL Axiata to determine the steps that will be taken in the future.

II. METHOD

A. Research Method

The research method used in this research is a descriptive method with a quantitative approach. Descriptive research is defined as research conducted to determine the value of independent variables[5]. Quantitative research is defined as a research method used to examine a certain population or sample and research data in the form of numbers that will be measured using statistics as a test tool for calculations, to produce a conclusion.

B. Population

The population in this research was all customers from XL Axiata in West Java. According to data obtained from nPerf on November 13, 2022, the population in this research amounted to 5.900.000 people[6].

C. Sample

The number of populations used in this research is quite large, so in this research used samples taken from the population to determine the population studied. The technique used is simple random sampling, where sampling of population members is carried out randomly without regard to things in the population used[7]. From the population used in the previous explanation, the researcher decided to use the equation proposed by Taro Yamane (1967) to determine the sample size that could represent the population used in this research[8]:

$$n = \frac{N}{1 + Ne^2} \qquad (1)$$

Description:
n = Sample size / Number of samples
N = Total population = 5.900.000
e = Fault tolerance rate (%) = 5%

The fault tolerance rate used in this research was 5%. Thus, the minimum number of samples required based on Equation (1) for this research was 399.97 People or 400 People rounded.

D. Data

This research uses primary data. Primary Data is data collected directly by researchers from their first source[7]. The primary data was obtained from the results of distributing questionnaires to respondents is XL Axiata customers in West Java with a minimum number of respondents in accordance with the calculation of the number of samples. The data generated from the distribution of questionnaires is in the form of numbers, which will then be processed using SPSS (Statistical Product and Service Solution) Version 25 software.

E. Data Collections Method

In this research, the data used was data from the results of the questionnaire that was shared with respondents. Questionnaires is a data collection technique that is carried out by giving a respondent several questions or written statements to answer[9]. Data collection uses Google Form as a platform to create questionnaires and distribute links from Google Forms that have been created to potential respondents. Data collection from respondents does not look at gender, age, occupation and so on, only respondents must meet two criteria, customers from XL Axiata and domiciled in West Java. The minimum respondents that must be obtained in accordance with the calculation of the minimum number of samples that have been done before is 400 respondents. The form of the questionnaire distributed to respondents will be explained next.

F. Research Instrument

This research uses the SERVQUAL method, then the questionnaire formed follows the theory of the SERVQUAL method[10]:
- Has five dimensions that have been determined by the SERVQUAL method, Tangible, Reliability, Assurance, Empathy, and Responsiveness which will be used as variables in research instruments.
- Has a total of 22 questions or statements, with each dimension or variable having the number of questions or statements that have been determined by the SERVQUAL method, Tangible (four questions/statements), Reliability (five questions/statements), Assurance (four questions/statements), Empathy (five questions/statements), and Responsiveness (four questions/statements).
- Each question or statement has two assessment answers, perception and expectation.
- Each scoring answer uses an ordinal scale that has four answer options where each answer option represents the respondent's assessment score of the question or statement asked in the questionnaire, namely Excellent (4), Good (3), Sufficient (2), Bad (1).

Questions or statements on the questionnaire that were formed were adjusted to the needs of this research, so that before the main question or statement was added a question to verify respondents whether they met the criteria needed in this study, domiciled in West Java and XL Axiata customers, and on the questionnaire a note was added that the assessment was based on the time of the Covid-19 pandemic in Indonesia. The following is an overview of the form of the questionnaire distributed to respondents which can be seen in Table I:

Table 1. Questionnaire Form

	Questions/Statements	Answer	
	Is your domicile in the West Java region?	YES/NO	
	Name the city/district where you live	Short Answer	
	Are you a customer of XL Axiata?	YES/NO	
	Please specify the first four digits of the XL Axiata cellular operator number that you have	Short Answer	
Variable	**Questions/Statements**	**Answer**	
		Perception	**Expectation**
Tangible	1) XL Axiata uses modern network technology. 2) XL Axiata's physical facilities look visually attractive. (example: XL Center) 3) XL Axiata customer service always looks neat. 4) Material related to internet network services provided from XL Axiata (example: brochure) looks visually appealing	Ordinal Scale	Ordinal Scale
Reliability	5) The internet network provided from XL Axiata rarely occurs interference in accessing the internet 6) XL Axiata provides services with fast internet network 7) XL Axiata provides stability and strength of the internet network in various places 8) XL Axiata keeps promises regarding the internet network provided (example: customers get internet quota as promised) 9) When customers are constrained by the internet network, XL Axiata is always willing to solve these obstacles	Ordinal Scale	Ordinal Scale
Assurance	10) XL Axiata's treatment to customers makes customers believe in the services provided by XL Axiata 11) Customers feel comfortable in transacting with XL Axiata 12) Customer service from XL Axiata is always polite to customers 13) Customer service from XL Axiata has sufficient knowledge to answer customer questions	Ordinal Scale	Ordinal Scale
Empathy	14) XL Axiata pays individual attention to customers 15) XL Axiata has convenient customer service operating hours for customers 16) XL Axiata has customer service that provides individual attention to customers 17) XL Axiata has services that make customers interested 18) Customer service from XL Axiata understands the specific needs of customers	Ordinal Scale	Ordinal Scale
Responsiveness	19) Customer service from XL Axiata is fast and reliable in responding to complaints and handling internet network problems experienced by customers 20) Customer service from XL Axiata is always willing to help customers with their complaints 21) Customer service from XL Axiata is never busy to help customers with their complaints 22) Customer service from XL Axiata immediately provides the right service according to customer wishes	Ordinal Scale	Ordinal Scale

G. Data Analysis Techniques

➢ *Validity Test*

The data that has been obtained from the questionnaire given to the respondents, then the validity test is carried out. A valid data means that the instrument used in the research can be used to measure the thing under research[11]. The validity test used in this research is to calculate the correlation between the value obtained from each question item and the overall value obtained. The method used is Spearman Correlation. If variable data is in ordinal form, validity testing is best using the Spearman Correlation method[12]. In the validity test in this research, using data processing software, SPSS (*Statistical Product and Service Solution)* Version 25. If the *significant* value in the test using SPSS is below 0.05, then the data tested is said to be valid or Data is said to be valid if the value of the correlation coefficient resulting from the test with SPSS is more than 0.3[11].

➢ *Reliability Test*

Reliability in research instruments is used to find out whether a measuring instrument used in this case questionnaires in the collection of research data is reliable. In this research, using Cronbach's Alpha for reliability testing.

The reason for using Cronbach's Alpha is because when conducting a literature review of the *SERVQUAL* method, the average reliability test uses Cronbach's Alpha and not only that most researchers use *Cronbach's Alpha* to test reliability. The reliability test values with Cronbach's Alpha vary, ranging in value from 0 to 1. The instrument tested is said to be reliable if the value of Cronbach's Alpha is more than 0.6[13]. In the reliability test in this research, using data processing software, SPSS (*Statistical Product and Service Solution*) Version 25.

➤ *Gap Score Analysis*

In this study, it used the SERVQUAL method to analyze how the quality of service was studied according to respondents, where one way to analyze it was using gap score analysis. With gap score analysis, the analysis carried out is to analyze the gap between performance (perception) and expectations (expectations) of a variable. In each variable, the calculation of the average performance and expectations from the data that has been obtained from the questionnaire that has been filled out by the respondent is carried out. If the calculation of the average performance and expectations of each variable has been carried out, then the following equation is used to calculate the gap of each variable as in Equation (2)[10]:

$$SQ = P - E$$

Description:
SQ = Service Quality
P = Average value of perception/performance
E = Average value of expectations/expectations

Equation (2) applies to the calculation of the value of each variable in the *SERVQUAL* method, so that the calculation is carried out five times, because there are five variables (Tangible, Reliability, Assurance, Empathy, and Responsiveness). After calculating each variable with the equation above, the average calculation of the gap calculation of the five variables is then calculated to get the value of the overall service quality (*SERVQUAL Score*). *SERVQUAL* Score will determine the level of customer satisfaction.

➤ *Importance-Performance Analysis (IPA)*

In this study, not only knowing how the quality of the services studied as a whole, but the IPA method was added to find out the characteristics of each variable in the *SERVQUAL* method from the quality of the service being studied[14]. IPA uses a two-dimensional graph whose horizontal axis is the value of performance (perception), and the vertical axis is the value of expectations (expectations) whose data is taken from the results of the previous gap score analysis. Thus, the two-dimensional graph in the IPA method used will have five points, a point for tangible variables, a point for reliability variables, a point for assurance variables, a point for empathy variables, and a point for responsiveness variables. The determination of the coordinate points of the five variables is taken from the data on the average value of perception and the average value of expectations from the gap score analysis that has been carried out previously. Also, the quadrant divisor line for the horizontal axis is the average value of the overall expectation value of the variable and for the vertical axis is the average of the variable's overall perceptual values. The data is processed using SPSS Version 25 software which will generate IPA graphs.

III. RESULT AND DISCUSSION

In collecting data, 436 respondents were collected who met the required criteria, XL Axiata customers and domiciled in West Java. The number of respondents obtained has exceeded the minimum number of respondents needed in this research, where the minimum number of respondents needed as discussed in the previous chapter is 400 respondents.

A. Validity Test Result

In the validity test, the data obtained is processed using SPSS Version 25 software and using the Spearman Correlation method. Here are the results of the validity test of each question or statement on each of the variables submitted to the respondent with a total of 22 questions or statements sorted as in Table II:

Table 2. Validity Test Result

Variable	Number of Question	Coef. Correlation	
		Perception	Expectation
Tangible	1	0.496**	0.384**
	2	0.509**	0.525**
	3	0.471**	0.452**
	4	0.548**	0.498**
Reliability	5	0.594**	0.560**
	6	0.605**	0.504**
	7	0.562**	0.536**
	8	0.512**	0.525**
	9	0.668**	0.618**
Assurance	10	0.668**	0.591**
	11	0.611**	0.600**
	12	0.545**	0.504**
	13	0.594**	0.502**
Empathy	14	0.569**	0.521**
	15	0.609**	0.560**
	16	0.621**	0.594**
	17	0.569**	0.560**
	18	0.583**	0.613**
Responsiveness	19	0.667**	0.616**
	20	0.611**	0.550**
	21	0.589**	0.548**
	22	0.575**	0.535**

It can be seen in Table II, the value of the correlation coefficient of all questions or statements on the questionnaire is above 0.3, so it can be concluded that the data obtained is valid and can be used to measure the thing to be studied.

B. Reliability Test Result

In reliability tests, the data obtained was processed using SPSS Version 25 software and using Cronbach's Alpha method. Here are the rally test results:

Table I. Reliability Test Result

Variable	N of Items	Cronbach's Alpha	
		Perception	Expectation
Tangible	4	0.692	0.643
Reliability	5	0.815	0.799
Assurance	4	0.768	0.738
Empathy	5	0.798	0.772
Responsiveness	4	0.776	0.756

It can be seen in Table III, the value of Cronbach's Alpha test results for each variable is above 0.6, so it can be concluded that the data obtained is reliable and can be used to measure the thing to be studied.

C. Gap Score Analysis Result

In determining how the quality of service is, using data obtained from 436 respondents, then the calculation of the average value given by respondents through a questionnaire for the five variables (*Tangible*, *Reliability*, *Assurance*, *Empathy*, and *Responsiveness*) is carried out which is the reference value for gap *score* calculations with the equations already discussed in the previous chapter. Here is the average value of each question or statement on each of the variables posed to the respondent with a total of 22 questions:

Table 4. Average Value for Each Question

Variable	Number of Question	Average Value	
		Perception	Expectation
Tangible	1	3.38	3.51
	2	3.32	3.44
	3	3.43	3.51
	4	3.30	3.45
Reliability	5	3.27	3.36
	6	3.29	3.41
	7	3.22	3.33
	8	3.39	3.44
	9	3.31	3.40
Assurance	10	3.41	3.46
	11	3.45	3.48
	12	3.50	3.53
	13	3.40	3.52
Empathy	14	3.38	3.40
	15	3.38	3.50
	16	3.34	3.43
	17	3.39	3.47
	18	3.36	3.39
Responsiveness	19	3.31	3.39
	20	3.39	3.49
	21	3.36	3.37
	22	3.36	3.46

From the average value obtained from each question or statement in Table IV, a re-average calculation of each question or statement is carried out that will represent each variable to obtain the average value of perceptions and expectations of each variable. Furthermore, gap score calculations are carried out from the calculation results with the equations discussed in the previous chapter for each variable and finally an average calculation of the gap score

calculation results of the five variables will determine the value of the service quality being studied. The following are the results of the gap score calculation and the overall service quality value (*SERVQUAL Score*):

Table 5. SERVQUAL Score Result

Variable	Average Value		Gap Score (Perception - Expectation)
	Perception	Expectation	
Tangible	3.36	3.48	-0.12
Reliability	3.30	3.39	-0.09
Assurance	3.44	3.50	-0.06
Empathy	3.37	3.44	-0.06
Responsiveness	3.35	3.43	-0.07
SERVQUAL Score			**-0.08**

As can be seen in Table V, customer assessment of the quality of internet network services from XL Axiata during the Covid-19 pandemic in West Java is negative from each variable or dimension studied, this results in an overall value of negative value, which means that customer expectations for the quality of internet network services from XL Axiata are higher than the quality of internet network services provided by XL Axiata today. However, this does not mean that the quality of services provided by XL Axiata is currently poor and does not satisfy its customers. If the results of the *gap score* analysis are between -2 and 2, then the satisfaction of the customer is at a moderate level with the services provided[15]. So, it can be concluded that the quality of internet network services from XL Axiata during the Covid-19 pandemic in West Java is quite satisfactory for its customers because the value of the *SERVQUAL Score* is -0.08 for all variables.

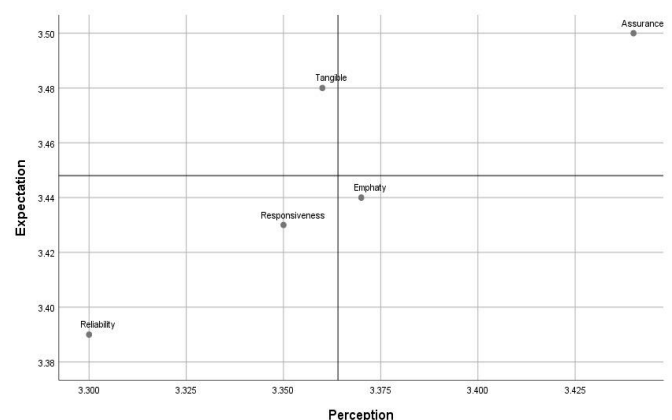*D. Importance-Performance Analysis (IPA) Result*

Fig 1. IPA Graph Result

Data from the previous analysis, the gap score analysis in Table V will be further processed using SPSS Version 25 to create an IPA graph to find out the characteristics of each variable in this research in the quality of XL Axiata internet network services during the Covid-19 pandemic in West Java. The data used is the average data of perception of each variable and the average data of expectations of each variable which

will be the coordinates of each point of the five variables (Tangible, Reliability, Assurance, Empathy, and Responsiveness), the horizontal axis is for perception and the vertical axis is for expectations, so the coordinates of each variable are Tangible (3.36,3.48), Reliability (3.30,3.39), Assurance (3.44,3.50), Empathy (3.37,3.44), Responsiveness (3.35,3.43). The quadrant divisor line, as it was before, is formed from the average value of expectations of the entire variable for the horizontal axis, which is 3.36 and the average value of the perception of the whole variable for the vertical axis, which is 3.44. Thus, the IPA graph that is formed can be seen in Figure 1.

The IPA graph in Figure 1 shows that the Assurance variable is in quadrant 1 (*Keep Up the Good Work*), so XL Axiata must maintain the performance of the Assurance variable. Tangible variables are in quadrant 2 (*Concentrate Here*), so tangible variables are variables that must be corrected immediately by XL Axiata. The Reliability and Responsiveness variables are in quadrant 3 (*Low Priority*), so the reliability and responsiveness variables can be the last variables to be corrected by XL Axiata. Finally, the Empathy variable is in quadrant 4 (*Possible Overkill*), so the Empathy variable is a variable that is considered not very important by customers.

E. Discussion

Based on the gap score analysis and Importance-Performance Analysis (IPA) that have been carried out previously, there are several things that can be described from each variable in this research that can be used as a reference to increase customer satisfaction with the quality of internet network services by XL Axiata due to the value of customer satisfaction with XL Axiata's internet network during the Covid-19 pandemic in West Java based on the *SERVQUAL Score* Still worth a minus which means there is a need to improve the quality of service. Here's the description of each variable:

➢ *Tangible*

The Tangible variable according to gap score analysis, has the largest gap score value among other variables, namely -0.12. Also, according to the IPA chart, this variable is in quadrant 2 (*Concentrate Here*) which means that customers have high expectations on this variable. However currently customer perceptions are low on this variable and there needs to be immediate improvement by XL Axiata. Things that can be done to improve this variable, such as the technology used is constantly updated so that service to customers always uses the latest technology, materials related to internet network services are made as attractive as possible for customers, and physical facilities that customers directly see such as the XL Center are made as comfortable as possible for customers.

➢ *Reliability*

The Reliability variable, according to gap score analysis, has the second largest gap score value among other variables, which is -0.09. Also, according to the IPA chart, this variable is in quadrant 3 (*Low Priority*), which means that this variable is not a threat to XL Axiata, and customer perceptions and expectations are low on this variable. However, judging from

the minus gap score value in this variable, XL Axiata must make improvements even though improvements to this variable have a low priority. Things that can be done to improve this variable, such as increasing the speed of the internet network that is currently available and increasing the stability and strength of the internet network in various places.

➢ *Assurance*

The Assurance variable, according to gap score analysis, has a gap score value of one of the smallest among other variables, namely -0.06. Also, according to the IPA chart, this variable is in quadrant 1 (*Keep Up the Good Work*) which means that this variable is a variable that is considered an advantage of XL Axiata that must be maintained for performance and can also be interpreted as customers believe in the services provided by XL Axiata, as well as high customer perceptions and expectations on this variable. However, judging from the minus gap score value in this variable, XL Axiata still must be improved. Things that can be done, such as trying to increase customer trust in the services provided and knowledge from Customer Service is further improved to answer customer questions appropriately.

➢ *Empathy*

The Empathy variable, according to the gap score analysis, has the same gap score value as the Assurance variable, which is -0.06. Also, according to the IPA graph, this variable is in quadrant 4 (*Possible Overkill*) which means that this variable has a high perception value in the services provided by XL Axiata but does not have an impact on overall customer satisfaction and can be interpreted as customers do not attach much importance to this variable. Also, this variable has a high perception and low expectations. Although customers do not attach much importance to this variable, based on the minus gap score, customers feel that they need improvement for this variable by XL Axiata. Things that can be done to improve, such as *Customer Service* pays more attention individually to customers and XL Axiata strives to meet the specific needs of customers.

➢ *Responsiveness*

The Responsiveness variable, according to gap score analysis, has the third largest gap score value of the other variables, which is -0.08. Also, according to the IPA chart, this variable is in quadrant 3 (*Low Priority*) just like the Reliability variable, which means that this variable is not a threat to XL Axiata, and customer perceptions and expectations are low on this variable. However, judging from the minus gap score value in this variable, XL Axiata must make improvements even though improvements to this variable have a low priority. Things that can be done to improve these variables, such as the speed and reliability of *Customer Service* from XL Axiata, are made improvements in responding to complaints and handling internet network problems experienced by customers and accuracy in providing services as desired by customers.

IV. CONCLUSION

From the research that has been carried out, it can be concluded that several important things:

➢ This study uses one of the methods in the *SERVQUAL* method, gap score analysis with five dimensions of the *SERVQUAL* method (Tangible, Reliability, Assurance, *Empathy*, and Responsiveness) which are used as variables in this research to determine customer satisfaction with the quality of XL Axiata internet network services during the Covid-19 pandemic in West Java through the *SERVQUAL Score* obtained. Furthermore, the resulting data from the *SERVQUAL* method is further processed using a modified *Importance-Performance Analysis* (IPA) to determine the characteristics of each variable.

➢ The test results using the *SERVQUAL* and Importance-Performance Analysis (IPA) methods to XL Axiata internet network users in West Java received results:

• Based on the *SERVQUAL* method, customer satisfaction is at a moderate level, which means that customers feel quite satisfied with the services provided. However, it is necessary to improve and improve the quality of service because the *SERVQUAL Score* value is minus (-0.08), which means that customer perception is below the expectations of the services provided.

• Based on the IPA, it is known the characteristics of each variable in this study that can be a reference for XL Axiata in improving or improving service quality to increase customer satisfaction, the Assurance variable is in quadrant 1 (*Keep Up the Good Work*) which is a variable that must be maintained and improved from this variable. The Tangible variable is in quadrant 2 (*Concentrate Here*) which is this variable must be immediately corrected to increase customer satisfaction. The Reliability and Responsiveness variables are in quadrant 3 *(Low Priority)* which is a variable that needs improvement, but the priority is low. Finally, the *Empathy* variable is in quadrant 4 (*Possible Overkill*) which is considered not very important for customers, but still needs to be improved by XL Axiata.

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