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## **THE EFFECT OF PRODUCT QUALITY AND SERVICE QUALITY ON CUSTOMER SATISFACTION AT PDAM TIRTANADI MEDAN LABUHAN BRANCH**

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### **ABSTRACT**

This study aims to analyze and determine the relationship problems of a variable product quality and service quality to customer satisfaction at PDAM Tirtanadi Medan Labuhan Branch. My research method is associative and quantitative. Where the population in my research is as many as 56 samples of respondents. Data collection techniques in this study were a list of questions, interviews and documentation studies. While the data analysis techniques used are classical assumption test, multiple linear regression, and hypothesis testing. The results showed that in the results of the study there was a significant influence between product quality on customer satisfaction, there was a significant influence between service quality on customer satisfaction, there is a joint influence between product quality and service quality on customer satisfaction. From the results of the analysis discussed, it is known that partially there is a significant effect of the independent variable (X1) on the variable (Y), there is a significant effect of the independent variable (X2) on the variable (Y) and there is a significant effect of the quality variable. product and service quality to customer satisfaction.

**Keywords: Product Quality, Service Quality, customer satisfaction.**

### **PRELIMINARY**

Customer satisfaction can be felt after customers compare their experience in purchasing goods/services from sellers or providers of goods/services with the expectations of the buyers themselves. These expectations are formed through their first experience in buying an item/service, comments from friends and acquaintances, as well as promises and information from marketers and competitors. Marketers who want to excel in the competition must pay attention to customer expectations and customer satisfaction.

So to deal with such situations and circumstances, entrepreneurs must be able and fast and responsive in making decisions so that the business they establish can develop properly. Business actors are required to be able to maintain the market and win the competition. In winning the competition, companies must be able to understand the needs and desires of their customers. By understanding the needs and desires of customers, it will provide important input for companies to design marketing strategies in order to create satisfaction for their customers and survive in competing in the market. According to Tjiptono (2012, p.146) "customer satisfaction is a person's feeling of pleasure or disappointment that arises after comparing the perception of the performance (result) of a product with his expectations".



At this time the customer is a very important role in the company, this is because customer satisfaction can provide benefits for the company. Customer satisfaction results from customer interactions with the company, therefore a better understanding of customers will lead to better levels of satisfaction and loyalty. Very satisfied customers believe that the company really understands and pays attention to the needs and expectations of each of its customers. To determine the level of satisfaction there are several factors that must be considered by the company, namely, factors related to product and service quality and factors related to prices and costs.

The service sector affects the condition of the community which is increasingly critical in obtaining the information they need. For this reason, service is the most important factor in a business world in the service sector because it is in the public interest.

According to Tjiptono (2012, p.51) suggests about "Product quality is a dynamic condition associated with products, services, people, processes, and the environment that meet or exceed expectations".

Many consumers complain that the water quality is not suitable for consumption. Where the quality of the water consumed is not clean and smells so that it makes consumers dissatisfied due to the water quality that is getting worse day by day.

This is one of the factors that the company does not pay attention to, namely the quality of service and product quality, so that customers will think again about using the product and will feel dissatisfied after buying or using the goods or services.

Meanwhile, according to Lupiyadi (2011, p. 158) states that "customers will be satisfied if the results of their evaluation show that the products they use are of high quality.

According to Lewis & Booms in Tjiptono, (2012, p. 157) said that "Service quality can be interpreted as a measure of how well the level of service provided is able to match customer expectations."

One of the public facilities that received attention is drinking water service. This is based on the fact that everyone needs water as a source of life. The drinking water service for Medan City in particular, and some areas in North Sumatra Province is carried out by PDAM Tirtanadi Medan Labuhan Branch.

Tirtanadi Regional Drinking Water Company is a company engaged in the service of providing clean water. One of the goals in the form of PDAM is to meet the community's need for clean water, including the provision, development of advice and infrastructure services and the distribution of clean water, while the other goal is to participate in developing the economy to support regional development by expanding employment opportunities, and

The company realizes the importance of quality service to provide satisfaction to its customers, but in practice the facilities and services supplies to support quality services are still inadequate. Customer satisfaction is an important element in the effort to increase customer satisfaction in a customer's desires, expectations and needs are met. A service is considered satisfactory if the service can meet the needs and expectations of customers. Providing good service the company is able to maintain/improve the quality and service provided, therefore if the service is not in accordance with what the customer expects, the customer will be disappointed, so we can know that the customer wants quality service from the company in order to get satisfaction .

## **THEORETICAL BASIS**

### **Customer satisfaction**

Customer satisfaction can be felt after customers compare their experience in purchasing goods/services from sellers or providers of goods/services with the expectations of the buyers themselves. These expectations are formed through their first experience in buying an item/service, comments from friends and acquaintances, as well as promises and information from marketers and competitors. Marketers who want to excel in the competition must pay attention to customer expectations and customer satisfaction. The definition of customer satisfaction below is:

According to Kotler and Keller (2013, p. 14), argues that the notion, "Customer satisfaction is reflecting a person's assessment of the perceived product performance (or results) in relation to expectations. If the performance of the product does not meet expectations, the customer is dissatisfied and disappointed; otherwise, if the product's performance matches expectations, the customer is satisfied. If the product's performance exceeds expectations, the customer is happy."

Then according to Tjiptono (2012, p.146) "customer satisfaction is a person's feeling of pleasure or disappointment that arises after comparing perceptions of the performance (results) of a product with his expectations".

According to Kotler (2013, p. 150) Customer satisfaction is "Feelings of pleasure or disappointment that arise and after comparing the performance (outcome) of the product with the expected performance (or result).

From the several definitions above, it can be concluded that customer satisfaction is a fulfillment of expectations. Customers can be said to be satisfied with the products and services provided by PDAM that have met and even exceeded their expectations.

### **Product quality**

Product in marketing terms is a physical form of goods offered with a set of images and services that are used to satisfy needs. Products are purchased by consumers because they can meet certain needs or provide certain benefits. Product characteristics include not only the physical aspects of the product (tangible features), but also non-physical aspects (intangible features) such as the image of the service that cannot be seen. Product quality is the ability of a product to carry out its functions, including durability, reliability, accuracy, ease of operation and repair, and its valuable attributes.

According to Mowen (2012, p.61) ", product quality is an evaluation process to customers for improving the performance of a product.

According to Kotler and Gery (2010, p. 115), "Product quality is one of the most reliable factors by a marketer in marketing a product".

According to Kotler and Armstrong (2010, p. 113) argues about "Product quality is to have a direct influence on customer satisfaction so that by increasing the ability of a product it will create a competitive advantage so that customers become more satisfied".

So from the description above it can be concluded that product quality is a dynamic condition that is interconnected although it can have different definitions, but the product essentially has a specification of an item or service that can lead to satisfaction that meets or exceeds expectations for consumers who use it.

## **Service quality**

Service quality must start from customer needs and end with customer satisfaction and a positive perception of service quality. As the party who buys and consumes the product/service, the customer is the party who judges the level of service quality of a company. The challenge is that the customer's assessment of the performance of the service they receive is subjective, because it depends on the perception of each individual. Below are some definitions of service quality according to experts as follows;

According to Lewis & Booms in Tjiptono, (2012, p. 157) said that "Service quality can be interpreted as a measure of how well the level of service provided is able to match customer expectations".

Ratna Sari and Aksa (2011, p. 107) state "service quality is how far the difference between reality and customer expectations for the service received/obtained".

According to Kotler and Keller (2013, p. 214) "any act or performance that one party can offer another that is essentially intangible and does not result in the ownership of anything. It's production may or not be tied to physical product".

From the above definition, it can be concluded that service quality is a comparison between the expected service and the actual service received. If the service received or perceived by the customer matches or even exceeds customer expectations, then the service is considered quality and satisfactory. However, if the customer finds that the service received is not appropriate or below customer expectations, then the service can be considered unqualified and disappointing.

## **RESEARCH METHODS**

To retrieve the data that has been collected in accordance with the needs and objectives of the study, the method used is an associative and quantitative approach. The associative approach is an approach using two or more variables in order to determine the relationship or influence of one with another (Sugiyono, 2012, p. 56).

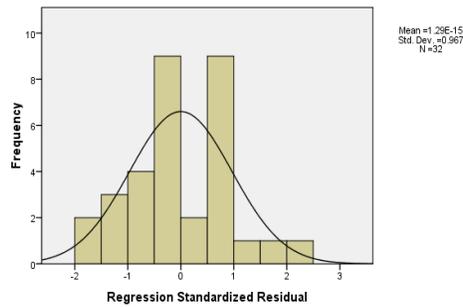
According to Sugiyono in Juliandi (2013, p. 14) quantitative research is research that is not carried out in depth, generally investigating the surface only, thus requiring a relatively shorter time. The reason for choosing this research is because it uses statistical analysis and is mathematical in nature.

## **RESEARCH RESULTS AND DISCUSSION**

### **Research result**

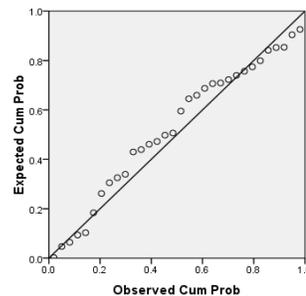
#### **Normality test**

The normality test of the data was carried out to see whether in the regression modal, this independent dependent variable had a normal distribution or not. If there is spread around the diagonal line and follows the direction of the diagonal line, then the regression model meets the assumption of normality. If the data spreads around the diagonal line and follows the direction of the diagonal line or the historical graph shows a normal distribution pattern, then the regression model meets the assumption of normality. Testing the normality of the data in this study was done by looking at the histogram graph and the normal P-Plot image.



**a. Figure 2. Histogram Graph Test Results**

1) Figure 2 above shows that the distribution of the study is normal, because the research curve forms a bell, it does not deviate to the left or right.



2)

**b. Figure 3. Normality Test Results**

3)

From Figure 3 above, it can be seen that the points still follow the diagonal line, do not deviate to the right and left, meaning that in this study the data distribution is normal.

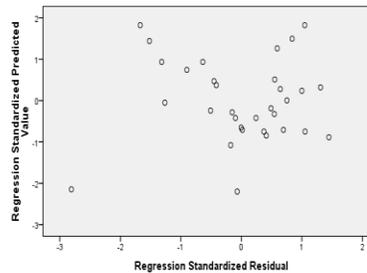
4) Multicollinearity testing is seen from the amount of VIF (Variance Inflation Factor) and tolerance if the low tolerance is equal to the VIF value = 1/tolerance. The cut off value commonly used to indicate the presence of multicollinearity is the tolerance value < 0.10 or the same as the VIF value > 10.

**c. Table 1. Multicollinearity Test Results**

| Model           | Unstandardized Coefficients |            | Standardized Coefficients | T     | Sig. | Collinearity Statistics |       |
|-----------------|-----------------------------|------------|---------------------------|-------|------|-------------------------|-------|
|                 | B                           | Std. Error | Beta                      |       |      | Tolerance               | VIF   |
| 1 (Constant)    | 13.416                      | 4.620      |                           | 5,904 | .000 |                         |       |
| Work engagement | .431                        | .081       | .547                      | 5.379 | .000 | .660                    | 1.439 |
| Product quality | .287                        | .080       | .440                      | 3,570 | .001 | .660                    | 1.439 |

5) From the table above, the value of *Tolerance* i.e. 0.660 is greater than 0.1 and the VIF value is 1.439, smaller than 10, meaning that it did not happen multicollinearity in this study.

This test has the aim of knowing whether there is an inequality of variance in the regression model from the residuals of one observation to another observation. If the variance from the residual of one observation to another observation remains, it is called homoscedasticity, it can be known through a scatterplot graph between the predicted value of the independent variable and the residual value



*d. Figure 4. Heteroscedasticity Test Results Pengujian*

6) Figure 4 above shows that the points spread randomly, do not form a clear regular pattern, and are spread both above and below the number 0 on the Y axis. Thus, there is no heteroscedasticity in the regression model.

7)

**8) Multiple Linear Regression**

Regression analysis is structured to see the relationship that is built between the research variables, whether the relationship that is built is positive or negative. Based on the data processing that has been done, it can be seen that the relationship model from multiple linear regression analysis can be seen from the following table:

**Table 2 Multiple Linear Regression Coefficientsa**

| Model           | Unstandardized Coefficients |            | Standardized Coefficients | T     | Sig. |
|-----------------|-----------------------------|------------|---------------------------|-------|------|
|                 | B                           | Std. Error | Beta                      |       |      |
| 1 (Constant)    | 13.416                      | 4.620      |                           | 5,904 | .000 |
| Product quality | .431                        | .081       | .547                      | 5.379 | .000 |
| Service quality | .287                        | .080       | .440                      | 3,570 | .001 |

a. Dependent Variable: Customer Satisfaction

Based on table 2, the regression equation research model can be arranged as follows:  
 $Y=13.416+0,431X_1+0,287X_2$

The multiple regression equation model means:

- a. Constant Value of 13,416 shows that if product quality and service quality do not change, it will increase employee customer satisfaction by 13.416%

- b. The value of the X1 coefficient is 0,431, meaning that if the Product Quality does not change or is equal to 0 it will increase the Customer Satisfaction of PDAM Tirtanadi employees, Medan Labuhan Branch by 4.31%
- c. The value of the X2 coefficient is 0,287 This means that if the Service Quality does not change or is equal to 0 it will increase the Customer Satisfaction of PDAM Tirtanadi employees, Medan Labuhan Branch by 2.87%.

**Hypothesis test**  
**t test (Partially)**

The purpose of the t-test is to see whether there is a significant relationship or not in the relationship between variables X1 and X2 to Y.

**Table 3. T . Test Results**  
**Coefficientsa**

| Model           | Unstandardized Coefficients |            | Standardized Coefficients | T     | Sig. |
|-----------------|-----------------------------|------------|---------------------------|-------|------|
|                 | B                           | Std. Error | Beta                      |       |      |
| 1 (Constant)    | 13.416                      | 4.620      |                           | 5,904 | .000 |
| Work engagement | .431                        | .081       | .547                      | 5.379 | .000 |
| Product quality | .287                        | .080       | .440                      | 3,570 | .001 |

a. Dependent Variable: Customer Satisfaction

**The Effect of Product Quality on Customer Satisfaction**

9) From the table above, it can be seen that the value of t is 5.379 and a sig value of 0.000, in this study Product Quality has an effect on Customer Satisfaction in PDAM Tirtanadi office Medan Labuhan Branch because the value of t count > t table (5,379>2.00) and a significant level of 0.000 <0.05 meaning H0: rs≠ 0, meaning that there is a significant relationship between Product Quality on Customer Satisfaction employees of PDAM Tirtanadi Medan Labuhan Branch .

10)

**The Effect of Service Quality on Customer Satisfaction**

11) From the table above, it can be seen that the value of t is 3,570 and sig value of 0.001, in this study Service Quality has an effect on customer satisfaction in PDAM Tirtanadi office Medan Labuhan Branch because the value of t count > t table (3,570>2.00) and a significant level of 0.001 < 0.05 meaning H0: rs 0, meaning that there is a significant relationship between Quality of Service to Customer Satisfaction of PDAM Tirtanadi employees Medan Labuhan Branch.

**F test (simultaneously)**

The F statistic test (simultaneous) was conducted to determine whether the independent variables (independent) together had a significant effect or not on the dependent variable (dependent). Simultaneous test results can be seen from the table below:

**Table 4. F . Test Results ANOVAb**

| Model |            | Sum of Squares | df | Mean Square | F      | Sig.  |
|-------|------------|----------------|----|-------------|--------|-------|
| 1     | Regression | 164.125        | 2  | 32.062      | 16,468 | .000a |
|       | Residual   | 162,732        | 53 | 4.957       |        |       |
|       | Total      | 226,857        | 55 |             |        |       |

a. Predictors: (Constant), Service Quality, Product Quality

b. Dependent Variable: Customer Satisfaction

The table above shows the calculated f value is 16,468 and the significant level is 0.000, with a total sample of 56 people and df-2 (56-2=54) the f table value is 3.17, in simultaneous research, product quality and service quality affect customer satisfaction in employees of PDAM Tirtanadi Medan Labuhan Branch seen from the value of f count > f table (16,468>3.17) and the significance value is 0.000 > 0.05.

**Coefficient of Determination (R2)**

The coefficient of determination is used to determine how much influence the independent variables have on the dependent variable. The value of the coefficient of determination is determined by the value of R square.

**Table 5. Coefficient of Determination**

| Model | R     | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------|----------|-------------------|----------------------------|
| 1     | .653a | .426     | .366              | 1.22648                    |

a. Predictors: (Constant), Service Quality, Product Quality

b. Dependent Variable : Customer Satisfaction

12) The table above shows the value of *R Square* namely 0.426 or 42.6% of the influence of Product Quality and Service Quality on Customer Satisfaction in PDAM Tirtanadi employees Medan Labuhan Branch while the remaining 53.7% is influenced by other variables not examined in this study.

## **DISCUSSION**

13) From the test results, it can be seen that all independent variables (Product Quality and Service Quality) have an influence on the dependent variable (Customer Satisfaction). In more detail, the results of the research and testing can be explained as follows:

### **The Effect of Product Quality on Customer Satisfaction**

14) According to Adhan et al (2020) Product quality is the level of individual satisfaction that they get commensurate benefits from various aspects of the work situation of the organization in which they work. Research conducted by (Puspitawati & Riana, 2014)(Jufrizen et al., 2017); (Jufrizen et al., 2018); (Jufrizen, 2015); (Mujiatun et al., 2019); (Adhan et al., 2020) which shows that product quality has a significant positive effect on customer satisfaction. This shows that the higher the product quality, the higher the customer satisfaction.

Partial test results Product Quality Affects Customer Satisfaction in PDAM Tirtanadi office Medan Labuhan Branch because the value of  $t$  count  $>$   $t$  table ( $5,379 > 2.00$ ) and a significant level of  $0.000 < 0.05$  meaning  $H_0: r_s \neq 0$ , meaning that there is a significant relationship between Product Quality on Customer Satisfaction PDAM Tirtanadi Medan Labuhan Branch

### **The Effect of Service Quality on Customer Satisfaction**

According to Arda (2017) Service quality is an ideal situation in supporting the implementation of tasks according to the rules in order to support work optimization. Research conducted by (Rumoning, 2018) which shows that Service Quality has a positive and significant effect on customer satisfaction. This shows that the higher the Service Quality, the higher the Customer Satisfaction.

The results of the partial test of Service Quality have an effect on Customer Satisfaction PDAM Tirtanadi Medan Labuhan Branch because the value of  $t$  count  $>$   $t$  table ( $3,570 > 2.00$ ) and a significant level of  $0.001 < 0.05$ , meaning  $H_0: r_s = 0$ , meaning that there is a significant relationship between Service Quality on Customer Satisfaction in PDAM Tirtanadi Medan Labuhan Branch

### **The Influence of Product Quality and Service Quality on Customer Satisfaction**

In concurrent research Product Quality and Service Quality have an effect on Customer Satisfaction on PDAM Tirtanadi Medan Labuhan Branch seen from the value of  $f$  count  $>$   $f$  table ( $16,468 > 3.17$ ) and the significance value is  $0.000 > 0.05$ , then the R Square value is 0.426 or 42.6% of the influence of Product Quality and Service Quality on Customer Satisfaction in PDAM Tirtanadi Medan Labuhan Branch while the remaining 57.4% is influenced by other variables not examined in this study, Product Quality and Service Quality have an influence on Customer Satisfaction, to increase Customer Satisfaction, employees must improve the relationship between employees and leaders as well as employees with other employees. In order to create quality service employees. If the results of product quality and employee service quality are good and in accordance with company goals, it will increase customer satisfaction.



**15)** The results of research conducted by (Nurlaely & Riani, 2016) which shows that product quality and service quality have a significant effect on customer satisfaction together. This shows that if the product quality and employee service quality are higher, it will lead to good customer satisfaction.

## **CONCLUSION**

Partially, product quality has an effect on customer satisfaction at PDAM Tirtanadi employees, Medan Labuhan Branch. Partially Quality of Service has an effect on Customer Satisfaction in employees of PDAM Tirtanadi Medan Labuhan Branch. And simultaneously Product Quality and Service Quality have an effect on Customer Satisfaction in employees of PDAM Tirtanadi Medan Labuhan Branch.

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