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The Infrastructure Performance of Wajo Regency's Regional Water Company Based on Costumer's Perceptions

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Abstract. Regional Water Company (PDAM) is a company that serves the clean water needs for Wajo Regency. Because there are still many customers' complaints, it is deemed necessary to analyze the performance model of PDAM Wajo Regency infrastructure and analyze how to improve its performance. The data collection method used was a questionnaire by distributing to 155 PDAM Wajo Regency customers and then processed using the SPSS application. Based on the condition of the existing PDAM Wajo Regency infrastructure can be categorized as good. The infrastructure performance model of PDAM Wajo Regency based on customer perception is Y = -0,280 + 0.192X1 + 0.229X2 + 0.202X3 + 0.174X4 + 0.226X5, X1 is realiability variable, X2 is tangible variable, X3 is responsiveness variable, X4 is empathy variable, and X5 is assurance variable. Correlation coefficient (R) is 0.993. The assurance variable has the greatest influence at 28,216% performance for PDAM Wajo Regency infrastructure. The average performance of PDAM Wajo Regency infrastructure based on customer perception is 3.75 categorized as having a good performance. How to improve PDAM Wajo Regency performance is according to customer perceptions by developing a water treatment plan (IPA), replacing damaged distribution installations, replacing customers' damaged water meters, replacing non-functioning main water meters, and replacing damage distribution pipes. regular metering and water tariff review, according to Permendagri Number 71 Year 2016. Training needs to be held for all employees to improve the quality of human resources of PDAM Wajo Regency.

1. Introduction

Infrastructure is an essential facility, where the continuity and growth of the community are very dependent. Infrastructure is closely related to the population and socio-economic population. In short, it can be said that in line with the increasing population, the urban facilities and infrastructure system will continue to grow. This demand is related to the level of clean water services provided by the government. One of the important components of basic urban infrastructure is clean water services [1].

Water as a vital source of life is a vital and fundamental resource for the survival of living things in this world [2]. Regional Water Company (PDAM) of Wajo Regency is a company that serves the needs of water in Sengkang City specifically in Tempe District, Wajo Regency, and Water Treatment Plan (IPA) which helps the quality of the water. The Regional Water Company (PDAM) of Wajo Regency continues to improve the quality, continuity, and water discharge quantity.

Until today, there are 14,000 customers in Wajo Regency. However, there are many complaints from the customer. It must be evaluated again by the PDAM to increase customer satisfaction. The quality of clean water from PDAM has become a public complaint in Tempe District, Wajo Regency. The color is brown to not be used for cooking or used for washing food utensils before being deposited [3].

The water supply in Wajo Regency is decreasing. It has an impact on the decline in the distribution of clean water to the level of customers. The distribution of clean water is currently down to 30%. According to the Director of PDAM Wajo Regency, it concerns the quality of raw water which does not support the very high turbidity level [4].

2. Research Method

2.1. Research Location and Time

This research was located in Tempe District, Wajo Regency, especially located in the PDAM Wajo Regency's water service area. Primary data collection and secondary data collection are collected in March - April 2020.

2.2. Sample and Population

The population of customers of PDAM Wajo Regency in the administrative area of Tempe District, are around 9,207 customers. The sample used in this study was 155 customers in the Tempe District service area. It was finding the representative sample using a simple random sampling, which is compiling a list of the total number of customers and does not differentiate identification and status because it is a single entity.

2.3. Research Variable

2.3.1. The Dependent Variable (Y). The dependent variable in this study is the performance of Wajo Regency PDAM infrastructure based on customer perceptions.

2.3.2. The Independent Variable (X). The independent variables in this study consisted of the reliability variable, tangible variable, responsiveness variable, empathy variable, and assurance variable. Reliability (X1) is the ability of PDAM to provide services based on what PDAM promised in a reliable and accurate. Tangible (X2) is the ability of PDAM to show their presence to external parties. Responsiveness (X3) is the willingness to help and provide fast and appropriate service to customers, how to convey information clearly. Empathy (X4) is giving sincere and personal attention given to the customer with an effort to understand each customer's wishes. Assurance (X5) is the ability, knowledge and politeness of PDAM employees to foster trust in customers.

2.4. Procedure

The first step is to review the research location and then share the research questionnaire to 155 customers in the Tempe District service zone. Secondary data collection in the form of PDAM's existing conditions, service zone of PDAM, and all the PDAM's technical data that we need.

After all data are received, data was processed using the SPSS (Statical Package for the Social Science) application to analyze the research data. Data analysis techniques used to process primary data obtained from the study sample are as follows:

2.4.1. Requirements analysis testing. Testing requirements analysis means to do data quality testing of primary data, then testing the validity and reliability testing.

- Validity test is test to find out which instrument items are valid and or which items are invalid. Valid items are indicated by a significant correlation between items and total item scores. To

find out which items are valid or not, by conducting a correlation coefficient significance test at the 0.05 significance level, it means that an item is considered valid if it has a significant correlation to the total score of the item.

- Reliability test is test to find out the consistency of the measuring instrument, so that the results of a measurement can be trusted. The statistical formula used is Alpha Cronbach's reliability analysis technique. The function of the formula is to find out the reliability of the questionnaire instrument as a measurement tool. To determine whether the instrument is reliable or not, certain limitations such as 0.6 can be used. Reliability of less than 0.6 is not good, while 0.7 is acceptable and above 0.8 is good.

2.4.2. Classical assumption testing. Before correlation and regression analysis is made, there are several tests that must be run first to test whether the model used represents or approaches existing reality. To test the feasibility of the regression model, it must first need test by the classical assumption test. There are three types of tests in this classic assumption test, the normality test, the multicollinearity test, and the heteroscedasticity test.

- The Normality test is used to test the data normally distributed or not. A good regression model is one that has normally distributed. There are two commonly used methods to test the normality of the regression model, namely by chart analysis (normal P-P plot) and statistical analysis (Z analysis of skewness and kurtosis scores) and One Sample Kolmogorov-Smirnov Test. Multicollinearity is the perfect or certain linear relationship between some or all of the independent variables of the regression model.
- The multicollinearity test aims to test whether a regression model has found a correlation between independent variables. If there is a correlation, then there is a problem called multicollinearity. A good regression model should not occur correlation between independent variables. If it is proven that there is multicollinearity, it is better if one of the independent variables is removed from the model, then the regression model is repeated (Santoso, 2012). To detect the presence or absence of multicollinearity can be seen in the amount of Variance Inflation Factor (VIF) and Tolerance. Guidelines for a multicollinearity-free regression model is to have a tolerance figure close to 1. VIF limit is 10, if the VIF value is below 10, then there is no symptom of multicollinearity [5].
- The Heteroscedasticity test aims to test the regression model that occurs variance or residual inequality one observation to another observation. There are several ways to detect the presence or absence of heteroscedasticity, one of which is the Park test. Park test is by regressing the natural logarithm value of the squared residuals with the dependent variable. If the significance value > 0.05 means there is no heteroscedasticity. If the correlation coefficient between the independent variables and the absolute value of residuals is significant, then the conclusion is heteroscedasticity (a variant of non-homogeneous residuals).

2.4.3. Hypothesis Test

- Multiple linear regression analysis is used to predict how the state (ups and downs) of the dependent variable if two or more independent variables as predictor factors are manipulated (raised the value down) [6]. The general equation of multiple linear regression is as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 \quad (1)$$

Y = Subjects in the dependent variable are predicted
a = Y if X= 0 (constant)
b = Regression coefficient
X = Subject in the independent variable has a certain value.

- The correlation coefficient shows how much the relationship that occurs between the dependent variable and the independent variables. Correlation values (r) range from 1 to -1. A value closer to 1 or -1 means that the relationship between two variables is getting stronger and a value close to 0 means that the relationship between two variables is getting weaker. A positive value indicates a direct relationship (X goes up then Y goes up) and a negative value shows an inverse relationship (X goes up then Y goes down).

Table 1. Interpretation of Correlation Coefficients.

Coefficient Interval	Relationship Level
0.00 – 0.199	Very Weak
0.20 – 0.399	Weak
0.40 – 0.599	Moderate
0.60 – 0.799	Strong
0.80 – 1.000	Very Strong

- F test is a test to determine the effect of independent variables on the dependent variable together. Decision making in the test is on condition that the calculated value f > f tabel. The formula for finding f tables is (k - 1; n - k) where k is the number of independent variables and n is the number of respondents or research samples.
- T test is an individual test of all regression coefficients which aims to find out the magnitude of the effect of each independent variable on the dependent variable. Significance test t seen from the value of the prob compared with the value of the level of significance α = 0.05. If prob <α, then the variable is significant. T-statistic test results (partial test) can also be compared with t arithmetic with t table with the provisions of t arithmetic> t table.

3. Result and Discussion

3.1. PDAM Wajo Regency Overview

Water service in Wajo Regency is managed by PDAM Tirta Dharma Wajo Regency whose status is currently still a Regional Government Owned Enterprise (BUMD) of Wajo Regency Government, based on Wajo Level II Regional Regulation Number 7 of 1976.

- Name : PDAM Tirta Dharma Wajo Regency
- Address : Jl. Lamungkace Toaddamang No. 4 Sengkang, Indonesia
- Telephone / fax : (0485) 22541 / (0485) 22299
- Email Address : pdamwajo@yahoo.com
- Website : https://pdamkabwajo.co.id/
- PDAM Vision : Wajo Regency PDAM wants to be the best role model in South Sulawesi and in Indonesia in the same scope of business and class level.

3.2. Wajo Regency PDAM Services in Tempe District

In December 2018 the number of customers served was 8,804. The addition of customers from 2018 - 2019 is 403 customers. The number of customers served by PDAM Wajo Regency Tempe District of December 2019 is 9,207 customers.

The Tempe District water treatment plan (IPA) is located in Tempe District, Wajo Regency, currently the Sengkang City water treatment plan (IPA) uses a raw water source in the Walanae River which empties into Tempe Lake. Water treatment plans use a water pumping system from raw water sources (Intakes) that are distributed to six water treatment plans namely, IPA 1, IPA 2, IPA 3, IPA 4, IPA 5, and IKK Tempe and then distributed to customers.

Service zones are divided into 3 distribution zones which are grouped based on the topographic condition of Sengkang City which is a hill, namely the top zone distributes to customers with a height

of 45 - 35 meters from the surface of raw water sources, the middle zone distributes to customers with a height of 29 - 15 meters from the source surface raw water, and the bottom zone distributes to customers with a height of 14 - 5 meters from the surface of raw water sources.

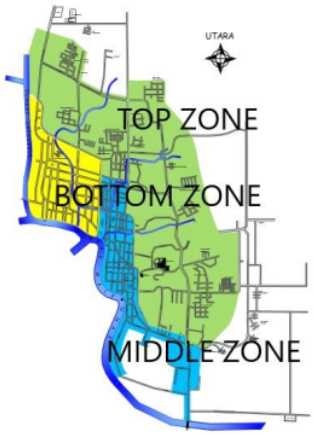

Figure 1. Service Zone

3.3. PDAM Wajo Regency Existing Condition

3.3.1. Raw Water Source. Clean water requirement is physically clear, odorless, colorless, tasteless and does not contain solid ingredients. The second is chemically does not contain chemicals in the amount that exceeds the threshold (physiological disturbance) and free of toxins. The third is biologically does notcontain pathogenic organisms and does not contain other micro organisms (causes of disease disorders) [7]. Wajo Regency PDAM's raw water is sourced from the Walanae River. This river has a length of 47 km and a width of 115 m with a discharge of 184,000 liters/sec. Raw Water Quality based on Makassar Health Laboratory Test Results Report No:19003869/LHU/BBLK-MKS/II/2019 to raw water sources. It can be concluded that the water quality of the Walenae River still meets the water quality requirements as raw water quality.

3.3.2. Intake Building. Intake Building, which is a building or construction at the location of the water source that is useful as a place to collect water for the supply of clean water. Wajo Regency PDAM has 2 intakes. Based on observations in the field, the intake condition is still good. All PDAM need to do is re-arrange pipes and cables, especially at intake 1.

Figure 2. Intake Building 1

Figure 3. Intake Building 2

3.3.3. Water Treatment Plan. Wajo Regency PDAM has 5 IPAs in the City Center (Sengkang City) and 8 IKKs spread in Wajo Districts. At IPA 1, the physical building is mostly good, only poorly maintained. Pre-experimentation tanks are no longer used as pretreatments. The 4 pre-sedimentation tanks are used as reservoirs of clean water. At IPA 2, the clarifier tub was modified by adding a tube settler, but it did not help the processing process because the IPA was planned with a sludge blanket system, the floc formed in the form of a mud blanket and the slats were thick and heavy enough to slide in the cone section of the tub and collected in the hoppee and then discarded. The existence of a tube settler disturbs the formation of the mud blanket. In addition, this sludge blanket system is vulnerable to hot temperatures which causes flocks to break easily. At IPA 3, the physical condition of the building is still good but the results of processing are not optimal, especially in the formation of mud blankets, this can be caused by the influence of hot air and not optimal application. The end result of the processing is quite good, but this is because of the filtration unit which causes the filtration unit to be washed frequently (backwash). At IPA 4 the physical building is still good, just like IPA 3 the formation of mud blankets is not optimal so it is recommended because of the influence of hot air and not optimal application. Also, at IPA 5 the physical condition of the building is still good, only lacking maintenance. The final processing results are also quite good. In the IKK of Tempe the physical building is still good, only lacking maintenance. Unable to see in detail each operation unit because the building is compact, the final result of the processing is quite good.

3.3.4. Reservoir. Reservoir is a water storage building that has been treated in a water treatment plan, which functions to balance between the production and discharge discharges that fluctuate for 24 hours. Total existing reservoir for Tempe District services is 1,800 m^3. Reservoir in good condition.

3.3.5. Transmission Pipe. The transmission pipes used at intake 1 and 2 are of steel and PE pipe types. Especially for intake 2 transmission pipes, the diameter of the transmission pipe used today is 3 x 200 mm with a length of ± 1,100 meters. The total length of transmission pipes in PDAM Wajo Regency is 8,995 m.

Figure 4. Transmission Pipe in Intake 2

3.3.6. Distribution Pipeline. Distribution pipelines, are piping systems used in the field for the distribution of clean water. This network system is the most expensive part of a clean water company. That is why the planning of a pipeline network must be carefully designed so that the system can work efficiently and optimally. The distribution of clean water from Wajo Regency PDAM for city area services is divided into 3 service zones. Each of these service zones can be connected between one zone and the other regulated by a gate valve in each service zone. As for the problems in the distribution unit, among others: New operating hours reached 10 hours / day, leakage of distribution water is very high (34.58%), there is no zone water meter, there are still old pipes (ACP, GIP) that have exceeded the age technically, there is no wash out for the sediment drainage system in the pipe, and there is no air valve at certain points for the release of air in the pipe.

3.4. Hipotesis Test

3.4.1. Multiple Linear Regression Equation Test. The total existing reservoir for Sengkang City services is 1,800 m^3. Reservoir in good condition. In this research multiple regression analysis models are used because there are more than one independent variable. This model is used to determine the effect of Reliability (X1), Tangible (X2), Responsiveness (X3), Empathy (X4) and Assurance (X5) significantly to the dependent variable, namely PDAM Wajo District Performance (Y).

Table 2. Coefficients Table.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	-0.280	0.172		-1.628	0.106					
X1	0.192	0.007	0.267	25.819	0.003	0.581	0.904	0.246	0.848	1.180
X2	0.229	0.012	0.214	19.067	0.086	0.668	0.842	0.182	0.722	1.385
X3	0.202	0.013	0.233	15.284	0.002	0.838	0.781	0.146	0.391	2.559
X4	0.174	0.011	0.255	15.551	0.009	0.841	0.787	0.148	0.337	2.965
X5	0.226	0.011	0.322	20.511	0.001	0.864	0.859	0.196	0.369	2.711

According to the Tabel 2 the regression equation can be determined:

$$Y = -0.280 + 0.192X1 + 0.229X2 + 0.202X3 + 0.174X4 + 0.226X5 \quad (2)$$

Y : The Performance of Wajo Regency PDAM
a : A Constant
: Regression coefficient
X1 : Reliability
X2 : Tangible
X3 : Responsiveness
X4 : Empathy
X5 : Assurance

The results of the regression equation above can be interpreted as the Reliability Variable has a positive influence to the performance of Wajo Regency PDAM. Increasing Reliability by 1 unit will increase the Performance of PDAM Wajo Regency by 0.192. Tangible variable has a positive influence to the Performance of Wajo Regency PDAM. An increase of 1 unit Tangible will increase the performance of PDAM Wajo Regency by 0.229. Responsiveness variable gives a positive influence to the performance of PDAM Wajo Regency. Increasing Responsiveness by 1 unit will increase PDAM Performance in Wajo Regency by 0.202. Empathy variable gives a positive influence on the performance of PDAM Wajo Regency. Increasing Empathy by 1 unit will increase PDAM Performance in Wajo Regency by 0.174. Variable Assurance has a positive influence to PDAM Performance in Wajo Regency. An increase in Assurance of 1 unit will improve PDAM Wajo Regency's performance by 0.226.

3.4.2. Correlation coefficient. The value of the multiple correlation coefficient (R) is 0.993 and close to number 1 which means that shows a very strong relationship between the dimensions of Tangible, Responsiveness, Reliability, Assurance, and Empathy on performance of PDAM Wajo Regency based on customer perceptions. For the analysis of the coefficient of determination (R^2) is 0.986 which means that changes in performance of PDAM Wajo Regency based on customer perceptions (Y) can

be explained by changes in Tangible, Responsiveness, Reliability, Assurance, and Empathy together at 98.6%. While the rest, 1.4% is influenced by other variables outside the variables studied.

Table 3. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.993[a]	.986	.986	.27081	1.986

3.4.3. Relative Contributions and Effective Contributions. The relative contribution and effective contribution aims to find out how much the independent variable influence the dependent variable.

Table 4. Relative Contribution and Effective Contribution

	Variabel	RC	EC
X1	*Reliability*	15.733	15.513
X2	*Tangibel*	14.498	14.295
X3	*Responsiveness*	19.803	19.525
X4	*Empathy*	21.750	21.446
X5	*Assurance*	28.216	27.821
Total		100.000	98.600

Based on the table above, it contributed effectively to 98.6%. The variable reliability was 15.513%, the tangible variable was 14.295%, the response variable was 19.525%, the empathy variable was 21.444% and the assurace variable was 27.81[illegible]% while the remaining 1.4% were dependent on other factors studied. The effective contribution of the reliability variable is 15.733%, the tangible variable is 14,498%, the response variable is 19.803%, the empathy variable is 21.750% and the assurance variable is 28.216%.

3.5. Respondent's Response

The quality of service of PDAM that can give satisfaction to its customers is one of the important issues in realizing a professional and reliable public service system. The continuity of regional water company is very dependent on the existence and loyalty of its customers. Meanwhile, on the other hand customer loyalty requires a balance of satisfying service.

Analysis of the infrastructure performance of wajo regency's regional water company based on costumer's perception obtained from the five variables that have been stated in the questionnaire: reliability, tangible, responsiveness, empathy and assurance.

3.5.1. Reliability Variable. Subvariables on the reliability variable consists of 4, namely: X1.1. "What is the level of clarity of water flowed by PDAM" getting an average value of 3.58, X1.2. "How does the smell of water flowed by PDAM" get an average value of 4.79, X1.3. "How does the taste of water flowed by the PDAM get an average value of 4.33. X1.4. "How long does the PDAM drain water in a day" get an average value of 2.75. In general, respondent's perceptions of the questi[illegible] items on the reliability variable were at a score of 3.86. The four reliability subvariables, X1.4. has the lowest value of 2.75 which means that this subvariable has poor score interpretation.

In the dry season, the more turbid water will affect the amount of water produced, causing most of the capacity of the IPA not to be utilized. The installed IPA capacity is currently 130 liters/sec with a volume of 4,099,680 m^3. The capacity of the production IPA is 118 liters/second with a volume of 3,721,248 m^3. So that the capacity of IPA that is not utilized is 378,432 m^3. The way to overcome this is by developing the production capacity of clean water treatment plans and replacing heavily damaged distribution installations so that the supply of clean water to customers is sufficient to achieve continuity.

Table 5. Respondents's Response on Reliability Variable.

	Respondent's Response										Total		Total Score	Mean
	Very Bad		Bad		Moderate		Good		Very Good					
	F	%	F	%	F	%	F	%	F	%	N	F		
X1.1	55	35.5	0	0	0	0	0	0	100	64.5	155	100	555	3.58
X1.2	8	5.16	0	0	0	0	0	0	147	94.8	155	100	743	4.79
X1.3	26	16.8	0	0	0	0	0	0	129	83.2	155	100	671	4.33
X1.4	10	6.45	49	31.6	67	43.2	28	18.1	1	0.65	155	100	426	2.75
Mean														3.86

3.5.2. Tangible Variable. Subvariables on tangible variable consist of 4, namely: X2.1. "How does the water pressure flowing" get an average value of 3.90, X2.2 "How is the water tariff / price and the service charge of the PDAM" getting an average value of 2.79, X2.3. "How is the water bill payment applied by PDAM" getting an average value of 3.84. X2.4. "How easy is it to reach the PDAM service office" getting an average rating of 4.01. In general, respondents' perceptions of question items on tangible variables were at a score of 3.64. The four tangible subvariables, X2.2. with an average of 2.79 which means this subvariable has a poor interpretation of the score. Water loss has a big influence on operational costs because production costs are not balanced between the cost of water needs paid, so efforts are made to reduce water loss. The percentage of water loss can be minimized by replacing the old meter periodically with a maximum usage for three years, this is because the main material of the meter is a material that is easily corroded in addition to the placement of materials that can be exposed to direct sun and rain can further shorten the usage period, so it is very necessary to make periodic replacements. Meter replacement is done in stages to reduce meter procurement costs and operational costs. Under these conditions it is also very necessary that the directors of PDAM Wajo Regency review the water tariff according to Permendagri Number 71 Year 2016.

Table 6. Respondents's Response on Tangible Variable.

	Respondent's Response										Total		Total Score	Mean
	Very Bad		Bad		Moderate		Good		Very Good					
	F	%	F	%	F	%	F	%	F	%	N	F		
X2.1	0	0	27	17.4	5	3.23	79	51	44	28.4	155	100	605	3.90
X2.2	2	1.29	38	24.5	108	69.7	5	3.23	2	1.29	155	100	432	2.79
X2.3	3	1.94	16	10.3	58	37.4	4	2.58	74	47.7	155	100	595	3.84
X2.4	1	0.65	0	0	48	31	53	34.2	53	34.2	155	100	622	4.01
Mean														3.64

3.5.3. Responsiveness variable. Subvariables on responsiveness variable consist of 4, namely: X3.1. "What is the response of PDAM when customers make complaints" get an average value of 4.31, X3.2. "How is the speed of PDAM response to complaints submitted" getting an average value of 3.10, X3.3. "How is the ability of officers in completing work according to complaints" get an average value of 4.30. X3.4. "To what extent is the PDAM trying to prevent service delays" getting an average rating of 3.55. In general, respondents' perceptions of the items of questions on the responsiveness variable were at a score of 3.81. Of the four responsiveness subvariables, X3.2. with an average value of 3.10, which means that this sub-variable has poor score interpretation. A total of 23.2% of the sample thought that the Wajo District PDAM needed a long time in handling complaints and needed to contact the PDAM many times to get a response regarding the complaint. Based on the annual report of Wajo Regency PDAM, the number of HR is limited, only 25 people participated in the training or 26.6% of the 94 employees. So that what is noted for PDAM Wajo Regency is to improve the quality of its human resources in order to provide maximum service to the costumers.

Table 7. Respondents's Response on Responsiveness Variable..

	Respondent's Response										Total		Total Score	Mean
	Very Bad		Bad		Moderate		Good		Very Good					
	F	%	F	%	F	%	F	%	F	%	N	F		
X3.1	0	0	13	8.39	3	1.94	62	40	77	49.7	155	100	668	4.31
X3.2	1	0.65	36	23.2	83	53.5	16	10.3	19	12.3	155	100	481	3.10
X3.3	0	0	6	3	3	1.94	85	54.8	61	39.4	155	100	666	4.30
X3.4	9	5.81	11	7.1	39	25.2	78	50.3	18	11.6	155	100	550	3.55
Mean														3.81

3.5.4. Empathy Variable. Subvariables on empathy variables consist of 4, namely: X4.1 "How do PDAM staff respond in managing customers' suggestions" get an average value of 4.09, X4.2. "How is the communication carried out by PDAMs in carrying out services" getting an average value of 3.88, X4.3. "How attention PDAMs in serving customers personally" get an average value of 4.42. X4.4. "How can you get information on PDAM services" getting an average value of 3.45. In general, respondents' perceptions of the items of questions on the empathy variable were at a score of 3.96. All results from subvariable X4 are in good interpretation so that performance needs to be maintained.

Table 8. Respondents's Response on Empathy Variable.

	Respondent's Response										Total		Total Score	Mean
	Very Bad		Bad		Moderate		Good		Very Good					
	F	%	F	%	F	%	F	%	F	%	N	F		
X4.1	9	5.81	0	0	27	17.4	51	32.9	68	43.9	155	100	634	4.09
X4.2	4	2.58	9	5.81	39	25.2	53	34.2	50	32.3	155	100	601	3.88
X4.3	0	0	0	0	25	16.1	40	25.8	90	58.1	155	100	685	4.42
X4.4	4	2.58	35	22.6	45	29	29	18.7	42	27.1	155	100	535	3.45
Mean														3.96

3.5.5. Assurance Variable. Subvariables on the assurance variable consists of 4, namely: X5.1. "How accurate is the information provided by the PDAM" gets an average value of 3.07. X5.2. "How is the courtesy of officers" getting an average value of 3.99, X5.3. "Does the complaints and complaints service function well" gets an average rating of 3.56. X5.4. "Does the PDAM provide products and services that meet customer expectations" get an average rating of 3.37. In general, respondents' perceptions of the question items on the assurance variable were at a score of 3.50. Of the four assurance variables, X5.1. get an average value of 3.10 which means this subvariable has a poor interpretation of the score. The PDAM needs to improve the suitability of the service that the customer gets from what the officer does. So it is necessary to improve the quality of human resources of PDAM Wajo Regency so that the guarantee of service quality also increases.

Table 9. Respondents's Response on Assurance Variable..

	Respondent's Response										Total		Total Score	Mean
	Very Bad		Bad		Moderate		Good		Very Good					
	F	%	F	%	F	%	F	%	F	%	N	F		
X5.1	12	7.74	67	43.2	12	7.74	26	16.8	38	24.5	155	100	476	3.07
X5.2	0	0	0	0	56	36.1	44	28.4	55	35.5	155	100	619	3.99
X5.3	5	3.23	5	3.23	67	43.2	54	34.8	24	15.5	155	100	552	3.56
X5.4	1	0.65	20	12.9	61	39.4	67	43.2	6	3.87	155	100	522	3.37
Mean														3.50

4. Conclusion

The infrastructure of PDAM Wajo Regency can be categorized as good because the quality of clean water meets the requirements of clean water but does not meet drinking water requirements. The condition of the intake building is still good, the physical condition of the IPA is still good, only need maintenance, good reservoir conditions, transmission pipes are in good condition, distribution pipelines need to be repaired and replaced the old pipes.

The infrastructure performance of PDAM Wajo Regency model based on customer perception is Y=0.280 + 0.192X1 + 0.229X2 + 0.202X3 + 0.174X4 + 0.226X5, X1 is realiability variable, X2 is tangible variable, X3 is responsiveness variable, X4 is empathy variable, and X5 is assurance variable. Correlation coefficient (R) is 0.993 indicating a relationship of performance with the variable reliability, tangible, responsiveness, empathy and assurance is very strong. The assurance variable has the greatest influence at 28,216 % on the performance of Wajo Regency PDAM infrastructure based on customer perceptions. The average performance of PDAM Wajo Regency facilities based on customer perception is 3.75 which is categorized as having good performance.

How to improve PDAM Wajo Regency performance according to customer perceptions by develop water treatment plan (IPA), replace damaged distribution installations, replace customers's damaged water meters, replace non-functioning main water meters and replace damage distribution pipes. Regular metering and water tariff review according to Permendagri Number 71 Year 2016. Training needs to be held for all employees to improve the quality of human resources of PDAM Wajo Regency.

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