THE ANALYSIS OF FACTORS THAT INFLUENCE THE COST EFFICIENCY AT PDAM TIRTANADI SUMATERA UTARA PROVINCE

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Abstract

The background of the research was the inconsistency of previous studies on the customers oriented, sustainable system improvement, training and education on cost efficiency which has led to research gaps. The purposeof this study was to test and analyze the effect of customer oriented, sustainable system improvement, training and education on cost efficiency at PDAM Tirtanadi, North Sumatra Province. The type of the research was associative research. This research was conduceted at PDAM Tirtanadi, North Sumatra Province. The population of this study was distributing questionnaires to all heads of the Water Treatment Plant and the head of the departement in each branch of the company's IPA. This data was analyzed using the method of multiple linear regression analysis. The classic assumption test used the normality test, multicollinearity test, and heterokedacity test. And testing the hypothesis by test f and coefficient of determination. This research proves that customer oriented, sustainable system improvement, training and education have an effect on cost efficiency.

Keywords: *Cost Efficiency, Customer Oriented, Sustainable System Improvement, Training and Education*

A. Introduction

Level of efficiency is achieved with the optimal use of resources to produce maximum output. Basically, it focuses more on the ability of the efficiency of the Organization in the use of resources to achieve the goals expected. Efficiency can be seen from two sides, namely the ability of the Organization to achieve the specific results expected by using minimal resources or the ability of the Organization to use a number of resources to achieve results maximum (Mardiasmo, 2002; Mulyadi, 2007). One of the efforts that must be made by management to improve efficiency is to determine the direction and goals of the improvement of productivity and quality that will be implemented in accordance with the long-term direction of the company (Sukartini, Endrawati, & Meuthia, 2008).

The quality of the resulting product or service is expected to be offset by the cost of the optimal expenditure. costs as an expense, exchange rates, or the sacrifice is done to guarantee the acquisition of benefit (Carter, 2009). To get a good quality product with optimal cost can be done by applying Total Quality Management (TQM). TQM is a management system that elevates the quality of the products or services as a business strategy and focus to customer satisfaction by involving all members of the organization. The goal is to ensure that customers are satisfied against goods or services provided and there is no guarantee that the aggrieved parties.

In achieving the objectives, the principles of Total Quality Management is conducting a continuous system improvement so that the company can increase its profits through route charges, which the company improved output free of bad quality through the efforts of improvement of quality. This led to the company's operating costs are reduced. Thus the profits gained on the rise. Education and training is a fundamental factor in order for the resulting product quality course employees are given training and are encouraged to continue to learn that is not the end and did not know the age limit, each person in the company can improve technical skills and expertise of the profession. In particular training to improve the quality.

Improved quality is directly proportional to the increase in costs, so that when management decided to improve the quality, cost will automatically increase. This view is considered incorrect by the pioneer of the new paradigm in quality because it is said that the quality does not cost (quality has no cost). In practice, when at the time of the product/service is produced and there are still items are disabled or service that is not as expected then the error would be a waste for the company because it needed repair costs against such services so as to cause the image of the company become bad and impacting consumers into loyal (Kim & Larry).

However, when the improvement of the product quality constantly guarded, then the things that are not desirable precisely can be avoided. Factors quality of the product being the thing to really note in each provide services. Quality of service policy strategy adopted is expected to mengefisiensikan costs, so that complaints from customers zero (zero defects) can be achieved and become a standard work and quality of service remains secure.

The regional drinking water company (PDAM) Tirtanadi of North Sumatra is a company that provides services by producing clean water for the needs of his life much, PDAM Tirtanadi performs a water quality improvement efforts for the sake of fulfill customer satisfaction by way of focusing to the desires of the customer. Customer focus is the driving force in the implementation of TQM within a company. Focus to the customer are intended so that consumers were satisfied with the quality of the water that comes to them, when the water is up to the consumer is already in good shape kulitasnya certainly can mengefisiensikan costs that may occur.

Because of the need for community water especially Medan city high, so it requires the addition of water discharge, thus constructed is some of the well bore to support the availability of community water needs of the city of Medan. However the construction of the well bore the cost maintenes/perwatan machines (such as equipment well bore) to produce a quality in accordance with the water produced water treatment installations . Because water comes

from a well bore must be to be in the filter or filtering is performed from the sand- the sand, other than that the water comes from a well bore also contain lots of iron, and unsure whether the water could be rusty and make the pipes Channeling into fast, in order to maintain and improve the quality of the water system improvements required continuously or berkelenjutan. The purpose of the repair of the system on an ongoing basis is Any poduk or service produced by utilizing specific processes within a system or environment. Therefore, existing systems need to be improved continuously in order for the quality it produces can be increased by way of doing engine maintenance filter (a filter of sand), and drill wells lainys equipment continuously, if there He does care continuously then produced water quality is declining so that needs to be done washing pipes certainly cost as well, and to do the washing drain pipes in order to clean it back will be a lot of disposing water While the availability of water for the community are extremely limited, and with the water used for washing can be harnessed into revenue for PDAM Tirtanadi North Sumatra Province. And if not done treatment continuously then it is likely occurring equipment well bore can be damaged, and greater costs will occur because of replacement tool tools should do the well bore, and certainly for buy a new drill wells equipment is much more expensive than the cost her treatment, as so needed repair tersu shots.

Education and training is a fundamental factor. Everyone expected and encouraged to continue to learn, that there is no finally and knows no age limit. By learning, everyone in the company can improve the professional expertise and technical skills. To maintain the quality of the water is required, employees who can understand the system to get a good water quality, for it is necessary training and education to all employees in the field of water quality, such as new employees to replace the the old employees, or employees who have been demoted or old employees remain which continue to learn and be given training so that water quality improved, so it can follow a predetermined system so that water quality is maintained, and can increase water quality such as from which only limited clean water to water ready to

drink. With training and education he did, then the consumer is satisfied with the quality of the water that is up to them, because if the employees/officers not conducted training and education, employee or employees are unable to understand the system and hence costs that is going to arise more as large as the new meintenis replace equipment in the event of an error, use top-quality water that is up to the consumer be bad causing consumers become loyal and greater cost to fix it, as the washing of the pipeline, and other costs.

In realizing the maximum of services to customers, PDAM Tirtanadi North Sumatra Province should be able to meet the quality, quantity certainty and continuity of water distribution. based on the results of the performance evaluation of PDAM Tirtanadi North Sumatra Province that had been audited Financial Supervisory Agency and the construction of a representative of the Provinces of North Sumatra (BPKP) currently PDAM Tirtanadi North Sumatra Province have yet to fully meet the assurance about the quality, the quantity and kontinutas.

The quality and quantity problems often arise is that of customer complaints regarding water smell, little water, murky waters, dead water and water is not normal. In addition to issues regarding quality, quantity and continuity of water distribution, the problem of an increase in the cost of the use of chemicals also happens to PDAM Tirtanadi North Sumatra Province.

Previous studies regarding the influence of the related customer focus, continuous system improvement, and peatihan and education towards cost efficiency do (Sukartini, Endrawati and Meuthia, 2008) entitled the influence of application of integrated quality management is divided into 4 sub variables i.e. customer satisfaction, product quality, company culture and the quality of human resources towards production costs efisiesinsi.

There is a difference research on Customer Focus, continuous system Improvement And training and education towards cost-efficiency, meticulous by (Hamdani & Irsutami,

2015) entitled the influence of the application of Total Quality Management which consists of 4 sub variables i.e. focus to customers, the obsession to quality, teamwork, continuous system improvement, training and education as well as the empowerment and involvement of employees towards the cost efficiency of production. Research results showed the four sub variables have no effect and simultaneous partially to increased cost efficiency of production.

As for the goals of the research :

1. To test the influence of focus to the customer against cost efficiencies in the PDAM Tirtanadi province of North Sumatra.
2. To test the influence of continuous systems improvement towards cost efficiency at PDAM Tirtanadi of North Sumatra Province.
3. To test the influence of training and education towards cost efficiency at PDAM Tirtanadi of North Sumatra Province.

B. Method

Research Approach

This research uses data processing research approach to the analysis of Associative. According to (Azuar, Irfan and Saprinal, 2013) stated the associative research is research that seeks to examine how a variable have linkages or associated with other variables, or whether a variable is affected by the other variables, or whether a variable becomes a cause of changes in other variables.

Population and sample of the Population in this research is the whole head of Branch water treatment Installations that is in the PDAM Tirtanadi North Sumatra, consisting of 7 branches of the water treatment Installations and 6 head section so that the total population numbered 42 respondents. And samples on this research using a sample of the total population that is saturated are used in this research.

The technique of Data collection Data collection techniques As in this study was a detailed questionnaire and dokumentas. After getting the data then will do the testing data that is using the Test validity and Reliability

Tests. Data Analysis Techniques Data analysis techniques used in this research is

1. The classical Assumptions of the test which consists of Test Multikolonieritas test Heteroskedastisitas Test and Normality.
2. Descriptive Statistics Test.
3. Multiple Linear regression analysis.
4. Test the hypothesis
5. Coefficient Of Determination.

C. Research Finding

1. A Brief Profile Of The Company
   The research was carried out on the PDAM Tirtanadi of North Sumatra Province, staff who participated in this study include heads of water treatment Installations which amounted to 1 person, and Manager-Manager or head of section 5 of every branch of across the branch water treatment Installations. The head of the section consists of a public section head, head of processing, quality control section head, head of surveillance, head of M/E. Mechanical Engineering
2. Classic Assumption Test Results Test Of Normality
   Normality test aims to test whether the model regression, residual or penggangu variable has a normal distribution or not. Test for normality in this study using kolmogrov Smirnov Test- table test results following normality by using kolmogrov Smirnov-Test as follows:

Tabel 1 One-Sample Kolmogorov-Smirnov Test

		X1	X2	X3	Y
N		42	42	42	42
Normal Parameters[a,b]	Mean	33,8810	34,1190	15,0476	19,3571
	Std. Deviation	4,91986	4,38513	2,51776	2,84409
Most Extreme Differences	Absolute	,101	,095	,124	,106
	Positive	,101	,095	,090	,106
	Negative	-,068	-,084	-,124	-,090
Test Statistic		,101	,095	,124	,106
Asymp. Sig. (2-tailed)		,200[c,d]	,200[c,d]	,108[c]	,200[c,d]

Source: processed Data researcher

Test Multikolonieritas

In this study the author mengguankan the value of TOL (Tolerance) and VIF (Variance Inflation Factor), with the test results as follows:

Coefficients[a]

Model		B	Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	,897	1,390		,645	,523		
	X1	,563	,071	,974	7,924	,000	,229	4,363
	X2	,129	,058	,198	2,216	,033	,432	2,314
	X3	-,333	,106	-,295	-3,149	,003	,396	2,528

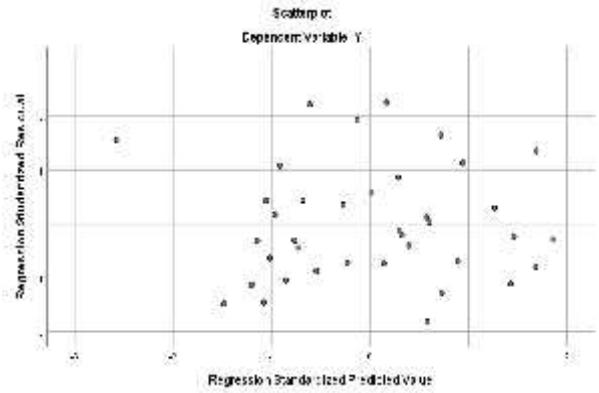
a. Dependent Variable: Y

Source: processed Data researcher

The entire variable TOLL greater than 0.10 and VIF entire variable is less than 10, it is in the shape of a regression model does not occur multikolinier symptoms.

Test Heteroskedasitas

Heteroskedastisitas the test results by using the method of analysis charts can be presented on the picture below:



Source: processed Data researcher

Based on the appearance of the scatterplot shown that Pictures of the plot spread randomly above and below the 0 on the axis of the Studentized Residual Regression. It can be inferred that heteroskedastisitas does not occur in the regression model.

3. Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
X1	42	23,00	45,00	33,8810	4,91986
X2	42	25,00	42,00	34,1190	4,38513
X3	42	10,00	20,00	15,0476	2,51776
Y	42	14,00	25,00	19,3571	2,84409
Valid N (listwise)	42				

Source: processed Data researcher

4. Multiple Linear Regression

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	,897	1,390		,645	,523		
	X1	,563	,071	,974	7,924	,000	,229	4,363
	X2	,129	,058	,198	2,216	,033	,432	2,314
	X3	-,333	,106	-,295	-3,149	,003	,396	2,528

Source: processed Data researcher

The results are incorporated into the equation of linear regression equation in mind so that double as follows:

Cost efficiency = 0.897 + 0.974 Focus to customer Repair System 0.198 + sustainability-0.295 training and education.

5. The results of the test of Hypothesis

Partial Test (test t)

a. Influence customer focus towards cost efficiency The value significance of 0.000 (smaller than 0.05) this shows that partially focus to customer influence on cost efficiency in the North Sumatra Province PDAM Tirtanadi.
b. Influence of continuous systems improvement towards cost efficiency The value significance of 0.033 (smaller than 0.05) this shows that continuous system improvement partially influence on cost efficiency in the PDAM Tirtanadi North Sumatra Province.

c. Influence of training and education towards cost efficiency The value significance of 0.003 (greater than 0.05). This shows that the partially training and education influence on cost efficiency in the PDAM Tirtanadi North Sumatra Province.

6. Determination of Koefesien

Model Summaryb

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,932[a]	,868	,858	1,07167

Source: processed Data researcher

In the table above can be known the results of regression analysis in contribution shows Adjusted R Square value (R2) or koefesien-koefesien are 0.858. This number identifies that cost efficiency (the dependent variable) is able to explain by focus to customers, continuous system improvement (independent variable) of 85.8%. As for the remaining 17.5% is explained by other reasons unknown in this research. Then Std. Error of the Estimate is of 1.07167 where the greater number of these regression models will make increasingly precise in predicting the cost efficiency.

D. Discussion

1. The influence of Focus to the customer on Cost Efficiency

Against PDAM Tirtanadi of North Sumatra Province Based on the results of hypothesis testing research obtained about customer focus influences towards cost efficiency is that partially focus to customer influence on cost efficiency at PDAM Tirtanadi North Sumatra Province. Increased focus on customer it will be followed by an increase in the cost efficiency of some kind. Its impacts will become increasingly more cost-efficiency increase.

These results showed that success and the success of the application of customer focus influences the cost efficiency, which the company always identify customer needs, having a mechanism to hear complaints of customers, had a program supporting employees to quickly resolve customer complaints and continue to do quality

improvement process in order to clean water that is up to the consumer's quality is maintained and can realize customer satisfaction, so that the costs will be issued to do the repair quality is steadily decreasing as the washing of pipes.

Before doing the cost-efficiency, then planning needs to be done by way of identifying customer complaints, create a mechanism to hear complaints of customers so that the company knows what steps will be done kedepanya so No customer complaints over and over time this has happened. And cost efficiency can be constantly improved.

2. The influence of continuous System Improvement on cost Efficiency Against PDAM Tirtanadi of North Sumatra

Based on the results of hypothesis testing research obtained regarding the influence of continuous systems improvement towards cost efficiency is partially hypothesis test results which showed that the influence of continuous system improvement towards cost efficiency is partially continuous system improvement effect on cost efficiency in the PDAM Tirtanadi of North Sumatra Province. The occurrence of an increase in continuous system improvement will then be followed by an increase in the cost efficiency of some kind. Its impacts will become increasingly more cost-efficiency increase.

Based on the answers of the respondents that have been collected, can be drawn the conclusion that the majority of respondents answer often from variable continuous system improvement means the heads of the installation of water treatment and the head of the Department stated that the improvement of continuous system can cost mengefisiensikan and becomes the important thing.

These results showed that success of the application of the system of continuous improvement affects cost-efficiency, so that the company can increase its profits from the route diamana company costs, increase output that is free of poor quality through the efforts of improvement of quality. This leads to reduced operating costs, thereby increasing the profit gained,

3. The influence of training and education Towards cost efficiency at PDAM Tirtanadi of North Sumatra

Based on the results of hypothesis testing research obtained partially continuous system improvement effect on cost efficiency in the PDAM Tirtanadi of North Sumatra Province. The occurrence of an increase in continuous system improvement will then be followed by an increase in the cost efficiency of some kind. Its impacts will become increasingly more cost-efficiency increase.

Based on the descriptive results of the responses of the respondents regarding the training and education of the head of the water treatment Installations and the heads of the bagiam answer: companies often give proper training about the concept of water quality improvement. the training can be for new employees continue to duberikan education and training in order to understand the production process in order to generate the water quality is good and can improve the quality of the water.

Based on the answers of the respondents that have been collected, can be drawn the conclusion that the majority of respondents said often of variable continuous system improvement means the heads of the installation of water treatment and the head of the Department stated the repair system can perform the continuous cost-efficiency and become important.

The results of this study support the research conducted by Meliyana & Renata, 2012) Sukartini & Meutia, 2008), (Lempoy, 2013), (Kurnaningsih, 2014), (Mayasari, 2011), Finasari, 2006). Stating that the continuous system improvement effect significantly to cost efficiency.

Education and training is a fundamental factor. Everyone expected and encouraged to continue to learn, that there is no finally and knows no age limit. By learning, everyone in the company can improve the professional expertise and technical skills. To maintain the quality of the water is required, employees who can understand the system to get a good water quality, for it is necessary training and education to all employees in the field of water quality, such as new employees to

replace the the old employees, or employees who have been demoted or old employees remain which continue to learn and be given training so that water quality improved, so it can follow a predetermined system so that water quality is maintained, and can increase water quality such as from which only limited clean water to water ready to drink.

With training and education he did, then the consumer is satisfied with the quality of the water that is up to them, because if the employees/officers not conducted training and education, employee or employees are unable to understand the system and hence costs that is going to arise more as large as the new meintenis replace equipment in the event of an error, use top-quality water that is up to the consumer be bad causing consumers become loyal and greater cost to fix it, as the washing of the pipeline, and other costs.

Based on the answers of the respondents that have been collected, can be drawn the conclusion that the majority of respondents answer the often variable statement cost efficiency means procedures and planning, training and repair system can cost efficiency.

Next koefesien test results of determination of retrieved showed that cost-efficiency can be described by focusing on the customer, the system of continuous improvement, training and education, but there are also explained by other causes It is not known in this research.

E. Conclusion

From the test results that have been addressed then the author makes some conclusions as follows:

1. Customer Focus effect on cost efficiency. which means that increased focus to customers will be able to improve cost efficiency.
2. Continuous system Improvement effect on cost efficiency which means that continuous improvements of the system will be able to improve cost efficiency.

3. Training and education influence on cost efficiency. which means that increased training and education will be able to improve cost efficiency.

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