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EFFECT OF TOTAL QUALITY MANAGEMENT AND JUST IN TIME ON PRODUCTION COST EFFICIENCY IN PT SEMEN PADANG

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Abstract

The application of Total Quality Management (TQM) is closely related to the quality of existing resources in the company. TQM provides a foundation for quality management and is an alternative in ensuring customer satisfaction, as well as Just In Time (JIT) which is a comprehensive and comprehensive production system. inventory management system where raw materials are purchased and produced as much as needed and used at the right time in every production process. In this study, the authors will examine the effect of TQM and JIT in efficiency of production costs at the manufacturing company PT Semen Padang in period 2016-2019. The data collection method was carried out by distributing questionnaires to each unit manager at PT Semen Padang which included managers of the accounting unit, human resource unit and production unit. The sampling technique used purposive sampling method and there were 67 samples. The analytical method used is to use the classical assumption test. Data analysis was also performed using the multiple regression method with the SPSS Ver.16 application Based on the results of the hypothesis testing, it shows that Total Quality Management (TQM) has a positive effect on cost efficiency and Just In Time (JIT) has a positive effect on cost efficiency.

Keywords: Total Quality Management, Just in Time, Cost efficiency

INTRODUCTION

Business competition is getting tougher at this time so that it demands every company to improve its business strategy. Previous business strategies may not be in accordance with changes in market mechanisms that are increasingly competitive and constantly changing so that their performance needs to be studied continuously. One of the strategies that needs to be discussed is planning production so as to produce an appropriate production planning to minimize costs and increase company efficiency. One of them is to use a management quality control (TQM) model or one based on JIT (just in time) is a structured system with a series of tools, techniques, and philosophies designed to create a corporate culture that has a focus on consumers, involves active participation of workers, and continuous quality improvement that supports total and continuous customer satisfaction, organizational, customer and market oriented systematic management through a combination of practical fact finding and problem solving, in order to create significant improvements in quality, productivity and other performance from the company, (Purnama, 2006). Competition Map of the Cement Industry in 2016-2019 which shows the map of competition in the cement industry in Indonesia, including the addition of 15 domestic players, but also the world's top cement companies, and currently PT Semen Padang is facing the challenge of oversupply of cement, due to average product cement absorbed in the market is only about 66 percent of the total cement production. National companies are also faced with new challenges, namely, the issuance of a policy of Regulation

of the Minister of Trade (Permendag) Number 7 of 2018 concerning permitting imports of clinker and cement to Indonesia. For cement production itself, for example, there has been an increase of 15 percent, from 6.5 million tons in 2016 to 7.4 million tons of cement in 2017. In 2018 and 2019 there is still an increase in production, but with this increase, the focus on efficiency is still emphasized more considering the sharp competition from outside manufacturers from China. The strategy is not only in improving product quality, but also in terms of developing innovations for cement derivative products which will have an impact on sales efficiency.

PT Semen Padang, which operates, must pay attention to the effectiveness of factory machines and the availability of raw materials. In the production process, of course, operational costs are a major highlight in terms of cost efficiency. In terms of processing finished products, it must be controllable so that there is no waste. With the application of the Just in Time method at PT Semen Padang, control is carried out in order to monitor implementation in achieving specific objectives predetermined by the company and to make corrections or adjustments optimally. Production cost control is needed so that production cost efficiency can be achieved so that optimal profit which is the main goal of the company can be obtained. Control of production costs can be done by setting standard costs. Standard costs are costs that are determined in advance, which is the amount of costs that must be incurred to make one product unit or to finance certain activities, Fitriyani, (2010). In addition, with the Just In Time (JIT) method, it is hoped that the company will be able to maintain all of its products by withdrawing from the entire system in the presence of demand, instead of pushing the entire system on a fixed schedule to anticipate demand. Likewise with the implementation of TQM (Total Quality management) at PT Semen Padang which in the end was able to increase customer satisfaction, employee satisfaction, and productivity so that employees were more motivated to identify ways to improve the delivery process and were able to reduce damage and ensure that the company's operations were running more efficient.

Thus, companies that are able to survive in the business world are companies that are able to produce quality products, reduce inventory costs, and produce less in accordance with consumer demand. Evidenced by the intense competition for all business lines of the company that are able to save money in carrying out their production and inventory that is not over, even until now it can survive and run production is efficiency in carrying out all operational activities and improving service quality.

LITERATURE REVIEW AND HYPOTHESIS

Cost Efficiency

According to Buana (2015) the efficiency of production costs can be measured through a comparison between actual production costs or production costs budgeted by the company. If the actual production costs that occur are less than the budgeted production costs, then the production costs can be said to be efficient. Likewise, if the actual production costs that occur are greater than what the company has budgeted for, the production costs can be said to be inefficient.

Total Quality Management

According to Gaperz (2002) quality management is "A Quality Management System is a set of documented procedures and standard practices for system management which aims to ensure the conformity of a process and product (goods / services) to the needs or requirements that are determined or specified by the customer or organization "Quality management defines how organizations implement quality management practices consistently to meet customer and market needs.

Just in Time

According to Hansen & Mowen (2001: 591), Just In Time (JIT) is a manufacturing approach that maintains that products must be withdrawn from the entire system in the presence of demand, rather than pushing the entire system with a fixed schedule to anticipate demand. is a comprehensive production system and inventory management system where raw materials are purchased and produced as much as needed and used at the right time in every production process.

PREVIOUS RESEARCH

Previous research is an attempt made to find comparisons and reference materials, as well as to avoid similarities with this research. In this article, the researcher lists some of the results of previous studies as follows:

Puspita (2006)	Effect of Application Just In Time Against Production Cost Efficiency and Production Cost Effectiveness	$X_1 = \text{Just In Time}$, $Y_1 = \text{Production Cost Efficiency}$, $Y_2 = \text{Production Effectiveness}$ has a significant effect	Descriptive method analysis	Significant effect
Khairunnisa (2008)	The effect of total quality management and just in time on the quality performance of the company	$X_1 = \text{Total quality management}$, $X_2 = \text{Just in time}$, $Y = \text{company quality performance}$.	Multiple linear regression analysis.	Significant effect
Sukartini, Endrawati (2008)	The Effect of the Application of Integrated Management on Production Cost Efficiency (Case Study at PT. Semen Padang)	$X_1 = \text{Implementation of quality management}$, $Y = \text{Efficiency of production costs}$	Regression analysis and coefficient measurement	Significant effect
Ratnasari (2009)	Just In Time System Analysis in an Effort to Increase the Efficiency of Production Costs (Case Study on the Ketchup Company "KUDA" Tulungagung)	$X_1 = \text{Just In Time}$, $Y = \text{efficiency of production costs}$.	Descriptive analysis	Significant effect
Supriatna (2012)	Implementation of Just In Time System for Production Cost Efficiency in M-02 Handicraf Manufacture Company	$X_1 = \text{Just In Time}$, $Y = \text{efficiency of production costs}$	Analyzed with a quantitative approach using statistical t-test method	No Significant effect

Hamdani (2014)	The Effect of Total Quality Management Implementation on Quality Cost Efficiency	$X_1 = \text{Total Quality Management}$, $Y = \text{Cost Efficiency}$	Multiple regression analysis	Significant effect
Sari <i>et al.</i> , (2014)	Just In Time System Analysis in an Effort to Improve Production Cost Efficiency (Case Study at PT. Malang Beautiful Genteng Rajawali Malang)	$X_1 = \text{Just In Time}$, $Y = \text{Raw material inventory}$	Descriptive analysis	Significant effect

HYPOTHESIS DEVELOPMENT

According to research conducted by Sukartini and Endrawati (2008), it shows that Total Quality Management has a significant effect on Production Cost Efficiency. Similar to research conducted by Hamdani (2014) which shows that Total Quality Management has a significant effect on Cost Efficiency. Furthermore, research conducted by Lempoy (2013) also has the same effect on Total Quality Management on cost efficiency. So it can be concluded that the hypothesis of variable X_1 is:

H1: Total Quality Management has a significant effect on Production Cost Efficiency

According to Sari & Saifi (2014), it shows that just in time can increase efficiency, which means it affects the efficiency of production costs. Likewise with research conducted by Ratnasari (2014) which shows that just in time also has a significant effect on increasing the efficiency of production costs. Then it can be concluded that the hypothesis for variable X_2 is:

H2: Just In Time has a significant effect on Production Cost Efficiency

RESEARCH FRAMEWORK

To make research and discussion easier, the writer will propose a chart or scheme that will be used as a guide in this study. Systematically, the framework of thinking in this paper is as follows:

In the chart above, it can be seen that the variable (X_1), namely Total Quality Management, has a significant effect on the efficiency of production costs, as well as the variable (X_2), namely Just InTime, which has a significant effect on the efficiency of production costs.

RESEARCH METHODS

Types of research

This type of research used in this research is quantitative research. This research is used to examine a specific sample or population, with the aim of developing and using mathematical models, theories and / or hypotheses related to the phenomena investigated by the researcher.

Object of research

The object of research is something that is of concern in a study or a place / location where someone is researching a research. In this study, the object of research is PT. Semen Padang in Indarung, Lubuk Kilangan, Padang City, West Sumatra 25157, Indonesia

Population and Sample

The population of this study were managers of each unit at PT Semen Padang. The sampling in this study was carried out using purposive sampling, namely the sampling technique with certain considerations, the sample selection was based on certain characteristics which were considered to have a relationship with known population characteristics. previous. Sampling in this study used the following criteria:

1. Accounting unit manager,
2. Human Resources Unit Manager,
3. Production unit manager.

The sample to be distributed is 67 samples. then each of the three unit managers will be taken as follows:

Sampling table

No	Manager Unit	Sample
1	Accounting Manager	3
2	Human resource Management	3
3	Production manager	61
	Amount	67

Source: Primary data processed, 2019

DATA ANALYSIS TECHNIQUE

DESCRIPTIVE ANALYSIS

From 67 samples distributed, the authors only managed to collect data as many as 46 samples. The characteristics of the respondents who were the subjects in this study were 46 managers, consisting of managers of the Accounting, Human Resources and Production units. The data obtained regarding the characteristics of the respondents are as follows:

Number of Respondents Based on Gender

No	Gender	Amount (people))	Persentase
1	Male	44	95,65
2	Women	2	4,35
	amount	46	100

Source: Primary data processed, 2019

Validity test

From the results of calculations that have been done that of the 28 items statement variable total quality management (X1) is said to be valid as many as 28 items because the Corrected Item Total Correlation of the statement $r_{count} > r_{table}$ so that it can be used for further

research, while the calculation of the validity is carried out. the Just In Time (X2) variable is said to be valid as many as 16 items where the Corrected Item Total Correlation of the statement $r_{count} > r_{table}$ so that it can be used for further research Likewise the cost efficiency variable (Y) is said to be valid as many as 6 items because it is corrected. Item Total Correlation of the statement $r_{count} > r_{table}$ so that it can be used for further research.

Reliability Test

From the reliability test results, it can be concluded that the Cronbach's Alpha value for the research variable total quality management, just in time, production cost efficiency is more than 0.70, namely for the total quality management variable where the value of Cronbach's Alpha is 0.793 while Cronbach's Alpha just in time is 0.928. and for Cronbach's Alpha production cost efficiency is 0.890 which as a whole gives the result that the variables studied meet the requirements for consistency. So the statement items for these variables can be used as a measuring tool in research

CLASSIC ASSUMPTION TEST

Normality test

According to Sujarweni (2016), the normality test aims to determine the distribution of data in the variables to be used in the study. Data that is good and suitable for use in research is data that has a normal distribution. Data normality can be seen by using the Kolmogorov - Smirnov Normal test. From the results of the normality test, it shows that the significant value of the Kolmogorov-Smirnov test of $0.200 > 0.05$ is normally distributed, so the data can be used for further research. To ensure this data is normally distributed

Multicollinearity Test

According to Gujarati (2012: 432), Multicollinearity testing is seen from the VIF (Variance Inflation Factor) and tolerance. Tolerance measures the selected independent variable that is not explained by other independent variables. So a low tolerance value is the same as a high VIF value (because $VIF = 1 / \text{tolerance}$). The cut off value that is commonly used to indicate multicollinearity is a tolerance value > 0.1 or equal to the VIF value < 10 , (Setiawan, 2014). From the test results, the tolerance value for the independent variable is 0.803 (total quality management), 0.803 (just in time) is in the standard tolerance 0.10, while the VIF value of all independent variables is less than 10, namely 1.245 (total quality management), 1.245 (just in time). This means that the analysis results show the absence of multicollinearity symptoms so that the test is feasible using multiple regression models.

Heteroscedasticity

According to Sujarweni (2016), the Glejser test suggests regressing the residual absolute value on the independent variable. If the significant probability is > 0.05 or 5%, heteroscedasticity does not occur, but if the significant level is < 0.05 or 5%, then heteroscedasticity occurs. The significant probability value of the independent variable is 0.712 (total quality management), 0.353 (just in time) $>$ from the confidence value level of 5%. So it can be concluded that this regression model does not contain heteroscedasticity.

Multiple Regression Test Results

According to Sujarweni (2016), multiple regression aims to test the effect of the independent variable (independent) and the dependent variable. Multiple regression has one dependent variable and more than one independent variable. Multiple analysis equation model is as follows:

$$Y = 3,340 + 0.1171 + 0.1732 + e$$

Information:

Y = community welfare

a = Constant

b = Regression coefficient

X1 = Accountability of financial management of village fund allocations

X2 = Village policy

X3 = Village Institution

e = error

1. From this equation, it can be seen that the constant = 3,340 shows that without the independent variables (total quality management and just in time) there is an increase in the efficiency of production costs, which is equal to the resulting constant value of 3,340.
2. Regression coefficient X1 = 0.117, meaning that each increase in the total quality management variable by 1 unit will increase the total quality management variable by 0.117 by assuming the other variables in the model are constant.
3. Regression coefficient X2 = 0.173, meaning that each increase in the just in time variable by 1 unit will increase the just in time variable by 0.173 by assuming other variables in the model are constant

t-test Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	3,340	2,763		1,209	,233
TQM	,117	,057	,294	2,042	,047
JIT	,173	,074	,336	2,336	,024

a. Dependent Variable: Efisiensi

The reference used is if t count > t table or sig value < 0.05 then H0 is rejected and Ha is accepted, but on the other hand, if t count < t table or sig value > 0.05 then H0 is accepted and Ha is rejected. With a significant level using $\alpha = 0.05$ and degrees of freedom (df) = Number of samples - 2 = 46 - 2 = 44. Referring to the t table, the t table results are 1.68023. It is known that the total quality management variable t count > t table is 2.042 > 1.68023 with a significant 0.047. The Sig value of total quality management (X1) is 0.047 < 0.05, then H1 is accepted, meaning that there is a significant influence between the total quality management (X1) variable on the efficiency of production costs (Y) at PT. Semen Padang. For the just in time variable the value of t count > t table is 2.336 > 1.68023 with a significant just in time variable (X2) of 0.024 < 0.05 then H2 is accepted, meaning that there is a significant influence between the just in time variable (X2) on efficiency of production costs at PT. Semen Padang.

A. Result (F test)

This test aims to show whether all the independent variables included in the model have a simultaneous influence on the dependent variable.

Summary F test Coefficients

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	217,340	2	108,67	8,62	,001 ^b
Residual	541,812	43	12,60		
Total	759,152	45			

a. Dependent Variable: EBP

b. Predictors: (Constant), JIT, TQM

Source: Processed SPSS Results, 2016

Based on the test results in the table above, it can be seen that the simultaneous significant value of the hypothesis is 0.001, this shows that the significant value is smaller than 0.05, it means that there is a significant influence together between total quality management (X1), just in time (X2), on the efficiency of production costs (Y) at PT. Semen Padang. The significant level used in the test is $\alpha = 0.05$, the degrees of freedom are df1 (number of variables - 1) = 3 - 1 = 2 and df2 (number of samples - number of variables) = 46 - 2 = 44. After seeing table F, then the results obtained for the f table amounted to 3.21. If we compare the value between f count and f table, then f count > f table, namely 8.624 > 3.21. So it can be concluded that total quality management and just in time together (simultaneously) have a significant influence on the efficiency of production costs at PT. Semen Padang.

B. Results of the Coefficient of Determination (adjusted R2)

To find out the contribution of the independent variable to the dependent variable, it can be seen from its adjusted R square. The coefficient of determination R2 in essence measures how far the model's ability to explain variations in the dependent variable. Multiple linear correlation analysis and multiple determination can be done using the SPSS 2016 for Windows program as shown in table below:

Determinaation Test Results Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,535 ^a	,286	,253	3,550

a. Predictors: (Constant), JIT, TQM

b. Dependent Variable: EBP

Source: Processed SPSS Results, 2016

Based on the above, it can be seen that the Adjusted R square value is 0.253. This shows that the total quality management and just in time to the efficiency of production costs is 25.3%. While the rest is contributed by other factors which were not examined in this study.

DISCUSSION

In partial testing (t-test), it shows that the total quality management variable has a significant effect on the efficiency of production costs at PT. Semen Padang, this can be seen from the significant value, namely $0.047 < 0.05$. And the value of $t_{count} > t_{table}$ is $2.042 > 1.68023$ meaning, if the total quality management variable is increased by one unit, the efficiency of production costs will increase by 0.117. Thus the first hypothesis (H1) "total quality management has a significant effect on the efficiency of production costs" is acceptable. This shows that the better the total quality management, the better the efficiency of production costs at PT. Semen Padang, this is in accordance with the results made by Sukartini, Endrawati (2008), who also saw that total quality management has a positive impact on the efficiency of production costs.

Meanwhile, from the results of the same test partially (t-test), the just in time variable also has a significant effect on the efficiency of production costs at PT. Semen Padang, this can be seen from the significant value, namely $0.024 < 0.05$. And $t_{count} > t_{table}$ is $2.336 > 1.68023$ meaning, if the just in time variable is increased by one unit, then just in time will increase by 0.173. Thus the second hypothesis (H2) "just in time affects the efficiency of production costs" can be accepted. This shows that if just in time has been implemented properly, it can increase the efficiency of production costs at PT. Semen Padang is in accordance with the results of previous research conducted by Sari et al., (2014), who also saw that just in time has a positive impact on the efficiency of production costs. With the effect of just in time on the efficiency of production costs means, at PT. Semen Padang, every manager and employee has been able and tried their best to reduce storage time which is a result of activities that do not add value, so as to save storage costs and make costs more efficient.

CLOSING

Conclusion

Based on the results of previous research, it can be concluded that, the object of research in this study is PT. Semen Padang. The research data used in this study is a questionnaire distributed to the managers of each unit at PT. Semen Padang. All data is processed using multiple linear regression analysis by looking at the validity and reliability test and hypothesis testing with the T test and F test. With the variables in this study, namely total quality management and just in time. PT. Semen Padang (H1). Just in time has an effect on the efficiency of production costs (H2). So by applying or using the application of total quality management and just in time the company can increase its cost efficiency, especially in production costs, where in this study these two systems can affect efficiency and increase efficiency, so as to increase company profits with increasing production activities.

Suggestion

Based on the results of the study, the researchers provided the following suggestions:

1. The researcher realizes that the research results obtained in this study still have a number of weaknesses due to the limitations the researchers have
2. Researchers in the future are advised to extend the study period by using more than 46 research respondents. This suggestion is important to increase the accuracy of the results that will be obtained in the future.
3. Researchers in the future are advised to look for one additional variable, total quality management and just in time as well as the variable production cost efficiency.

Thank-You Note

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