

# Cost of quality control to improve production cost efficiency and sales productivity (Case study on companies in Sidoarjo)

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## ABSTRACT

Companies require producing quality products at competitive prices. As a result, they should have an edge or more value than their competitors. This study aims to determine the optimal cost of quality control to be able to improve cost efficiency and productivity in the company. This study is using a qualitative approach. This case study is using interviews with managers and employees of the accounting firms to get information and documents. It shows that the companies have not yet reported the cost of quality; neither did they set standards for the cost of quality. Beside they did not analyze the reports relating to the cost of quality. The companies expected to report the cost of quality in particular, apart from reports of production costs. In charge of quality control, the company expected to set the standard for the cost of quality that should be removed. Control over the cost of quality also should be accompanied by an increase in sales. Analysis on the cost of quality cost should be done so at the expense of quality control can improve cost efficiency and productivity of the Company.

## ABSTRAK

Perusahaan perlu memproduksi produk-produk berkualitas dengan harga bersaing. Itu sebabnya, mereka harus memiliki keunggulan atau nilai lebih dari pesaing mereka. Penelitian ini bertujuan untuk mengetahui biaya yang optimal kontrol kualitas untuk dapat meningkatkan efisiensi biaya dan produktivitas di perusahaan. Penelitian ini menggunakan pendekatan kualitatif. Studi kasus ini menggunakan wawancara dengan manajer dan karyawan dari perusahaan akuntansi untuk mendapatkan informasi dan dokumen. Hasilnya menunjukkan bahwa perusahaan belum melaporkan biaya kualitas; juga tidak menetapkan standar untuk biaya kualitas. Selain itu mereka tidak menganalisis laporan yang berkaitan dengan biaya kualitas. Perusahaan diharapkan untuk melaporkan biaya kualitas secara khusus, selain laporan biaya produksi. Yang bertanggung jawab atas kontrol kualitas, perusahaan diharapkan untuk menetapkan standar untuk biaya kualitas yang harus dihapus. Kontrol atas biaya kualitas juga harus disertai dengan peningkatan penjualan. Analisis biaya atas biaya kualitas harus dilakukan dengan mengorbankan kontrol kualitas dapat meningkatkan efisiensi biaya dan produktivitas perusahaan.

## 1. INTRODUCTION

Nowadays, the business certainly comes up against force competition that requires any company producing quality products at competitive prices. Competition is evident from the many offers of similar products by brand, price, and quality of different companies that offered by competitors. Besides, consumers are increasingly selective in choosing the desired product. In order a company to “survive” in competition with other companies, it was required

to improve efficiency of production costs, but the reality of product quality and delivery time less attention so that there are companies that must spend a lot of costs associated with rework defective product, repair the defective product warranty and customer refunds, and other cost to find and correct mistakes. By creating quality products that will reduce costs such as warranty costs for the construction costs of defective products, and bolster (boost) in the quality of the products of the Company.

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The development of the concept of quality does not just stop at the quality of a product but also the quality of the operation of the product, because with an increase in the quality of the operation means that the same input can produce more output as well to reduce the number of defective products. Companies therefore need to control since the purchase of raw materials to finished products shipped to the customer and the company should always exercise control over the cost of achieving continuous quality improvement in cost efficiency and productivity of the Company. To achieve the desired ultimate goal, companies must improve performance from one period to the next. Improved performance can be achieved among others by doing process improvement, namely the activity of the Company to make improvements to the process that can help add value continuously. By performing process improvement, the Company will be able to create a competitive advantage to meet what the customer wants (customer). One focus of attention in the creating process improvement is to plan and control the activity of internal business processes or the production process within the company. Control activity is essential for production process since it leads to performance, improvement. In carrying out control in every activity undertaken by the company to meet the desires customer satisfaction, the company made measurements of any existing activity. Measurement of the activity is performed in addition to looking how length of time required by the company. And how much time the company committed to deliver products that meet customer demand.

Is a company which is engaged in the manufacture of leather footwear by order or specification of the customer. In its production activities, are still frequently found errors in the form of defective or damaged product customers often complain the quality of a product that does not comply with specifications. In the last three years, it was known that the quality cost to sales percentage from year to year tends to increase due to the products delivered to consumers is not in accordance with the expected. The Company is only able to lower the cost of quality by the year 2010 where there was a decrease of 0.60% over the previous year. The following are statements of quality costs as a percentage of sales.

### THEORETICAL FRAMEWORK

Hansen and Mowen (2005:7) argue that "quality costs are those costs that arise there may be or have

a poor quality product." This definition implies that quality costs associated with the two subcategories of activities related to the quality of the activities control and activities because of the failure. The meaning of cost of quality by Blocher, Chen and Lin (2009:404) is "The cost of prevention activities related to the identification of improvement and rectification of poor quality products as well as the opportunity cost of production time and lost sales due to poor quality".

### Classification of Cost of Quality

Blocher, Chen and Lin (2009:404) the cost of quality can be classified into four categories described as follows:

1. Prevention Costs, the costs incurred to prevent quality defects resulting product costs include: (a). Quality of training costs, (b). Quality planning costs are expenditures for wages and overhead for quality planning in improving the quality and reliability of supplier evaluation. (c). Equipment maintenance costs incurred to install, maintain, repair, and monitor equipment, processes and production systems, (d). The cost of underwriting the supplier to ensure that the component costs of raw materials received meet company quality standards, (e). Information system costs, the costs incurred to develop data requirements, measure, audit and report on data quality, (f). Products redesign and process improvement, the costs incurred to evaluate and facilitate the process of production or reduce quality problems, (g). Group of quality, costs incurred to determine the quality problems and provide solutions to improve the quality of products and services.
2. Internal Failure Costs, the costs incurred due to poor quality that is found through the assessment before the product is delivered to the customer. Some internal failure costs are: (a). The cost of corrective action, or re-charged for the time used in finding the cause of the failure and fix the problem, (b). The cost of rework and production materials, (c). The cost of the process, the cost to redesign the product or process.
3. External Failure Costs, the costs incurred to repair damage after a product or service quality is not acceptable to achieve customer and lost profit opportunities caused by the delivery of products or services that cannot be acceptable to the customer. The following is the cost of external failure costs.

Among the costs of quality, external failure costs are the most expensive because the company

**Table 1**  
**Cost of Quality Components**

<b>Prevention Costs</b>	<b>Internal Failure Cost</b>
Training	The remaining material
Salary of instructor	Rework
Testing Equipment	Losses due to poor quality
Cost of external training	Re-inspection costs
Salaries and wages of training and education	Costs of termination of employment
Planning and implementation of quality programs	
Salaries, expenses for prevention equipment, the cost of meeting	
Promotion of quality	
Expenditures for awards and recognition, printing and	
distribution of pamphlets and posters of the quality program	
The redesign of the product	
Improvement of the process, the quality of a society	
<b>Assessment Cost</b>	<b>External Failure Cost</b>
Inspection of raw materials	Sales returns and the reduction due to quality
Inspection of goods in process	defects
Inspection of finished goods	Warranty costs
Test equipment	Margin contribution from sales orders canceled due
Acquisition, maintenance	to quality defects
Salaries and wages	

will earn bad reputation for the products, loss or an opportunity to add customers, causing a decline in sales. Table 1 is a component of cost of quality by Blocher, Chen and Lin (2009:405).

Furthermore, explained by Blocher, Chen and Lin (2009:408) that prevention and appraisal costs are cost of conformance. These costs are the costs and opportunity costs for the rejection of products or services. The cost of quality is the sum of the cost of conformance and nonconformance.

The better prevention of low quality obviously will lose all the other quality costs. The fewer problems the less quality assessment is needed because the products are made well in advance. Theoretically, the company's success in prevention efforts will cause the company does not need to pay assessments and failures, both internally and externally. It is easier to design and establish or improve the quality rather than inspecting quality.

### **The View against Costs of Quality**

A lot of company is used to think that to meets quality standards a lot of company is used to think must be accompanied by increasing in costs. For one thing, that approach to quality control is expensive. This view is questioned by the pioneers of quality. Juran examined the economic aspects of the quality and concluded that the benefits are so far exceed the cost of quality. According to Tjiptono and Anastasia (1998:41) there are three categories of growing view among practitioners about the cost of quality, namely: (a). Higher quality means that the higher cost of quality attributes such as performance and additional characteristics pose a greater

cost in terms of manpower, raw materials, design and other economic resources. The added benefit of improving the quality can not cover the additional costs, (b). The cost increase is lower quality than the savings generated. This view was first proposed by Deming and adopted by the Japanese manufacturers. The savings was resulting from reduced levels of rework of defective products and other direct costs associated with damage. In this view is the foundation for continuous

### **Measuring Costs of Quality**

The cost of quality Hansen & Mowen (2005:9) can be classified as a cost that can be observed or hidden. Observable quality costs are the costs that are or may be obtained from the company's accounting records. Hidden costs of quality are the chance or opportunity costs that occur because of poor quality (the opportunity cost is usually not served in the accounting records).

In the hidden costs of quality, there are methods shared to have been developed to measure the hidden costs of quality. These methods developed after the fact that the hidden cost of quality is that although costs are not expected but always there even adversely impact to the company and with the risk of losing market share. Hansen and Mowen (2005:9) suggest that there are three methods used to estimate the hidden costs of quality are:

1. Multiplier Method. This method assumes that the total cost of product failure is several times the costs of failed products are measured. Total cost of product failure = k (the cost of failed products as measured externally) where k is the

multiplier. K value is obtained based on experience. For example, Westinghouse Electric noted the value of k between 3 and 4. Thus if the external cost of failed products measured were \$ 2 million, then the actual product cost of external failure is between \$ 6 - \$ 8 million. This method has a drawback because the determination of k is only based on past experience that the magnitude of hidden costs that arise from external failures can not reflect the actual conditions.

2. Market Research Method, this method is used to assess the effect of poor quality of sales and market share. The results of market research can be used to estimate future loss of earnings due to poor quality. Market Research Method is done by means of consumer surveys and interviews with the sales department. This method has the disadvantage, among others:
  - a. Difficult to implement because in addition to the market investigation carried out sometimes not representative of all segments of consumers who use these products.
  - b. Less able to reflect the company's actual loss as a result of defective product/poor quality
3. Taguchi's Quality Loss Function, Genichi Taguchi and Y. Wu (Blocher, Chen and Lin 2009:399) proposed approach to the suitability of the absolute quality as off-line quality control. This approach gives more attention to the level of upstream activities such as product design and manufacturing process planning and operations. Taguchi believes that these dimensions need to be refined before going into the production process. Taguchi loss function assumes that any deviation from the target value of the quality characteristics of quality that will lead to hidden costs. Taguchi quality loss function can be explained in the following equation :

$$L(y) = k(y-T)^2, \quad (1)$$

where

$k$  = constant proportional to the amount of which depends on the structure of the organization's external failure cost of the product

$y$  = the actual value of the quality characteristics

$T$  = the target value of quality characteristics

$L$  = loss of quality.

To use the Taguchi's loss function should be estimated value of k. K value is calculated by dividing the estimated cost on a particular specification of the squared deviations from the target value limits:

$$K = c / d^2, \quad (2)$$

where

$c$  = a loss in the upper or lower specification limit

$d$  = distance from the target value limits.

Method of measuring the cost of quality with Taguchi method has several advantages when applied in the company. The advantages of this method include: (1). Allow the company to conduct an analysis of the resulting product consequently can be detected so that the deviation level, (2). Motivate companies to continuously improve the quality of the products resulting from the Taguchi method of the view that the resulting product must reach the target value, (3). Companies can identify and estimate the magnitude of the hidden costs of quality.

The weakness of Taguchi methods include: (1). This method only calculates the cost which is absorbed by a product that can not meet the target value and does not provide the techniques and the development of quality control in the future and is only suitable when applied to manufacturing companies that produce goods with a high degree of accuracy, (2). The use of this method requires a little complicated statistical calculations that required resources that are really able to implement it. It also required special expertise in statistical analysis.

Tjiptono and Anastasia (1998:42) a common standard used in determining the optimal level of quality costs is as follows: "A company with a quality control program with a good cost budget standard costs to determine the quality of any group or individual so that the cost of quality budgeted a total of not more than 2.5% of sales."

### Reporting Costs of Quality

Costs of quality were reported to make management aware of the magnitude of the cost of quality and provide the basis for measuring the impact of quality improvement activities. Financial reporting quality costs can be easier used in the show because of quality problems in the unit value that is easily understood by management.

After all data has been collected and classified in accordance with the elements of quality costs, it needs to be made a report on the cost of quality (see Table 2) that occurred in the company to management on a periodic basis. The success of this step depends on the success of the introduction of inflicting the cost of quality by managers and providers involved in the company.

### Four Types of Costs of Quality Reports

Reporting of quality costs is critical to the success of the Company's quality improvement program. The success can be measured by the quality of perform-

**Table 2**  
**Costs of Quality Report**

Jensen Products			
Quality Cost Report for the year ended March 31, 1998			
Cost of prevention:			
The training of quality	\$ 35,000		
Engineering reliability	80,000	\$ 115,000	4.11
Cost of assessment:			
Material examination	\$ 20,000		
Product assessment	10,000		
Process assessment	38,000	68,000	2.43
Internal Failed Product Costs:			
Remaining Material	\$ 50,000		
Rework	35,000	85,000	3.04
External Failed Product Costs:			
Customer Complaints	\$ 25,000		
Warranty	25,000		
Repair	15,000	65,000	2.32
Total Cost of Quality			
Actual Sales \$ 2,800,000		\$ 333,000	11.9 (b)
\$ 333,000			
\$ 2,800,000			
= 11.98% = 11.9%			

Source: Hansen and Mowen, management accounting (1997: 440).

ance reports which consist of four kinds: (1). Reports of internal standard (internal standard report), which report shows the comparison between the cost of the actual quality and cost standards of quality are made at each end of the period. The cost of quality and quality budget each year and make plans to achieve a predetermined goal. The purpose of this report is to demonstrate the level of quality improvement relative to the specific targets reflected in the budget, (2). Trend reports a year (on year report), which report shows the comparisons of performance with last year now to find out how much the cost of quality is used two years ago with the aim to get broader information, (3). Trend reports a double period (multiple-period trend report), where the report reveals about the relative changes in the cost of quality for each period based on actual sales which aims to provide an overview to the management about the extent of quality improvement has been carried out this report form a graph illustrating the change the quality of some of the previous period, (4). Report long-term (long range standards report), which report shows the comparison of cost with the actual quality of the budgeted cost of quality in the long term at the end of each period, which made long-term standard refers to the Company's zero defect approach.

### Productivity

Hansen and Mowen (2001:1010) said that the productivity associated with the activities of producing the output (output) efficiently and specifically refer

to the relationship between the production (output) and raw materials (inputs) used to produce output. Typically, a particular combination or mix of inputs can be used to produce output at a certain level. Thus, productivity is the ratio of output produced with the input to produce output or productivity in an efficient output using input quantities as little as possible. This relationship is usually expressed as the ratio of output to the input. Relationship can be described by the following equation:

$$\text{Productivity Formula} = \frac{\text{Output}}{\text{Input}} \quad (3)$$

Productivity improvement program seeks to achieve total productive efficiency. The higher number the higher efficiency. Efficient could be developed in four ways: (a). By raising the output for the same input, (b). By raising the output is greater than the proportion of increase in input, (c). By lowering the same input to output, (d). By lowering the input is greater than the proportion of output decline. Although technical efficiency is productivity, but the replacement of input was able to offer a good opportunity for increasing overall economic efficiency. Choosing the right combination of inputs to be as important as choosing the right quantity of input.

### Measuring Productivity

Partial productivity Hansen and Mowen (2001:1012) is a quantitative assessment of changes in productivity. The purpose of these measurements was to assess whether the productive effi-

ciency has increased or decreased. Productivity measurement can be either actual or prospective. Measurement of actual productivity makes the manager can assess, monitor and control changes. Prospective observational measurement is forward, and this is the input for decision making. There are two types of productivity measures (Hansen and Mowen 2005:27). Namely:

1. Partial Productivity (Partial Productivity Measurement) is the measurement of productivity for one input at a time. If the outputs and inputs used in the formula above is expressed in physical quantities so that the resulting productivity ratio of operational productivity measure (operational productivity measure). If the output and input used in the rupiah, the resulting productivity ratio of financial productivity measures (financial productivity measure)

Mulyadi (2010:468) the advantages and disadvantages of partial productivity, among others:

- a. Excess partial productivity, namely:
  - Allows business managers decide to use a particular input.
  - Facilitate the operations staff to determine productivity performance. Operating personnel can only control certain inputs so that the partial productivity measures that provide feedback on the relationship between outputs with a specific input are easier to understand.
  - For the purposes of operational control, often short-term performance standards, as measured by comparing the present with the previous partial productivity.
- b. Partial productivity disadvantage, namely:
  - The possibility of exchange (trade-offs) the productivity of one input with another input productivity, total productivity measures need to measure the accuracy of decision-making on productivity. Just by looking at the size of the total productivity, managers can accurately draw conclusions about the performance of productivity.
  - Because of the possibility of exchanges between the input productivity, total productivity measures must take into account the financial consequences, and therefore the necessary financial productivity measures.

2. Total Productivity Measurement

It is the ratio of total finance to total factor input. Many Vendors only measure of productivity factors that are considered as a relevant indicator for the success of the Company's perform-

ance. In practical terms the total productivity measurement can be defined as focusing attention on some input that showed the success of the Company. There are two approaches (Hansen & Mowen 2001:1014) which have gained some recognition are:

- a. Profile measurement, which provides a set of series or a separate sector and differentiate a partial operational measurements. These profiles can be compared at any time to provide information about changes in productivity.
- b. Measuring productivity relating to the income (profit-linked productivity measurement), which measures the amount of change in earnings attributed to the change in productivity is a sense of productivity measures related to earnings.

This study uses the approach profile measurements due to find out information about changes in productivity so that companies can make info decisions relating to the Company's increased productivity.

### **Relationship between Cost of Quality, Cost Efficiency, and Productivity**

In general, increasing the quality will improve productivity and vice versa. Improved quality also means reducing the number of defective or damaged products and reduced rework, which will reduce the resources (labor and raw materials), used to produce the same output. In other words if the quality increases, productivity will also increase.

Productivity improves when the company can do as much work at a lower cost and when output rises without a cost increase. Another way to improve productivity is to improve process quality so that employee work more efficiently and do not have to spend time correcting mistakes on defects, mistakes, errors, and rework are a drag on productivity. Poor quality can slow the output of both individuals and the form as a whole. For that reason, one of the supervisor's most important tasks is to think of and implement ways to get the job done right the first time.

### **3. RESEARCH METHOD**

This study used a qualitative approach, which according to Moleong, Lexy J (2006:6) this approach uses a qualitative approach that is an approach to research that aims to understand the phenomenon of what is experienced by study subjects for example the behavior, perceptions, motivations, actions, and etc. in a holistic manner and in the form of

**Table 3**  
**Production Cost Report Year of 2009 - 2011 (in Rupiah)**

	Year 2009	Year 2010	Year 2011
The Cost of Raw Materials & Supporting Materials	104,674,589.00	188,749,759.00	104,486,948.00
<i>Direct labor costs:</i>			
Production Labor Costs	372,615,716.00	357,918,354.00	367,725,524.00
Rework Costs	83,785,423.00	69,202,393.00	56,292,302.00
<i>Indirect Labor cost:</i>			
Education and training costs	63,902,400.00	63,582,074.00	63,966,574.00
Quality Planning Cost	60,826,511.00	42,638,293.00	64,773,378.00
Examination of Raw Material Costs	44,612,098.00	32,492,093.00	36,593,426.00
Production Process Inspection Cost	78,302,831.00	63,823,829.00	57,829,373.00
Finished Goods Inspection Cost	23,751,087.00	34,029,375.00	41,138,379.00
Incentives of Employees	88,722,630.00	90,726,182.00	92,645,826.00
Total of Labor Costs	816,518,696.00	754,412,593.00	780,964,782.00
Cost of Electricity, Telephone & Water Business	54,938,009.00	56,837,937.00	60,937,846.00
Travel Costs	4,029,829.00	2,938,458.00	3,837,465.00
Transport costs	10,635,464.00	20,736,546.00	22,745,478.00
Medical Expenses	17,827,265.00	12,364,947.00	10,735,383.00
Consumption Costs	90,862,624.00	95,853,735.00	99,724,354.00
Machine Maintenance Costs	57,201,937.00	98,756,584.00	42,647,578.00
Vehicle Maintenance Costs	6,874,727.00	10,735,735.00	7,375,353.00
Machines Depreciation Costs	63,826,296.00	63,826,296.00	63,826,296.00
Inventory Factory Depreciation Costs	38,736,731.00	48,736,245.00	52,735,338.00
Facilities and Installations Depreciation Cost	9,006,373.00	9,006,373.00	9,006,373.00
Scrap Cost	43,520,187.00	61,973,483.00	52,725,172.00
<i>Other Costs:</i>			
Processing Costs	10,486,314.00	7,815,127.00	10,112,587.00
Packaging Cost	6,478,145.00	5,198,246.00	7,549,142.00
Storage Costs	5,418,925.00	4,712,980.00	5,174,624.00
Total of Overhead Costs	419,842,826.00	499,492,692.00	449,132,989.00
Total of Production Costs	1,236,361,516.00	1,442,655,044.00	1,343,240,356.00

Sources: Company's internal data processed.

words and languages, in a natural context and by using various scientific methods. This study departs from the problems in the company's efforts should be made to control costs so that the quality of cost efficiency in the company's productivity can be improved.

The method used in the qualitative approach is a case study. According to Yin (2004:1), the use of case study method can be seen from the definition of the case study itself: (a) When the principal research question regarding the word wondering how (how) or (why), (b) If the researcher has little chance to control the events that will be investigated, (c) When the focuses of the research are lying on the contemporary phenomenon (the present) in the real life context.

#### Types and Sources of Data

Types of data used in this study were (a). Qualitative data, the type of data non-shaped figure, a company overview, organizational structure, production processes, and others; (b). Quantitative data, i.e. data in the form of company numbers and

records relating to the object studied. While the source of the data derived from: (a). Primary data obtained from direct interviews or interviews with the manager of accounting, manufacturing, and other parts of the company and its employees, (b). Secondary data obtained from company documents and related literature.

After the data for the study can be obtained then the steps of data analysis that can be done are (a). Identifying the cost of quality of the production costs of existing reports in the company, (b). Classify quality costs into four categories: prevention costs, appraisal costs, internal and external failure costs, (c). Prepared a report on the cost of quality is based on actual sales of the previous period, (d). Analyzing the results of the comparison or the percentage of each total cost and its quality with actual sales, (e). Perform difference analysis (analysis of variance) favorable and unfavorable towards the cost of prevention, appraisal costs, internal and external failure costs, (f). Linking report quality costs with productivity and cost efficiency.

#### 4. DATA ANALYSIS AND DISCUSSION

As a manufacturing company which is engaged in the production of shoes, The Company is very concerned about the quality of products it produces. The selection of raw materials, production process to finished goods, all of these stages have a strict and careful supervision. It is intended to maintain and ensure the good quality of products produced and the improvement is one way to take the Company to give satisfaction to the consumers. In addition to product quality is assured, the next steps taken in providing satisfaction to consumers is by creating a competitive and affordable prices to consumers, the company will seek to improve cost control that can later be costs efficiency.

During this time the company has actually been increased in activity and quality control. It can be seen in the reports generated by the accounting company, which already contained therein data relating to the cost of quality. But the company still has not presented a report in particular the cost of quality that contains the amount of costs incurred to improve the quality of its products and also have not made the classification of quality costs into four categories of quality costs, i.e. prevention costs, appraisal costs, internal failure costs and external failure costs. All information about the cost of quality was noted in the report of the cost of production (see Table 3).

Lack of reporting quality costs are specifically and separately has led to close the information to the management about how much costs the company incurred and it is difficult to evaluate the improvement and quality control. Report the cost of quality can assist the management in the evaluation and assessment of control activities and improvement of product quality and to know the total costs incurred for these activities.

##### Discussion

##### **Identification and Classification of Identification and Classification of Components Cost Quality at the Company**

In charge of quality control programs at the Company incurred the costs associated with implementation, planning and quality control is commonly referred to as the cost of quality.

It is to identify and classify important quality costs conducted by the company to find out how much the costs incurred by each of the quality control activities. Based on all the cost data obtained, it is to be compiled and made of quality cost report, the next step is to identify and classify quality costs contained in the company. The results of the identi-

fication and classification have been done the result is as follows:

The components of quality costs at the Company in reports that are part of production costs, among others: (a). The cost of education and training, is part of the indirect labor costs in labor costs, (b). Maintenance costs of machinery and production equipment; (c). Maintenance costs of quality, is part of the indirect labor costs in labor costs, (d). The cost of raw material inspection, is part of the indirect labor costs in labor costs, (e). The cost of inspection of production process, is part of the indirect labor costs in labor costs, (f). The cost of inspection of finished goods, is part of the indirect labor costs in labor costs, (g). Rework costs (rework), is part of the indirect labor costs in labor costs.

Concerning the quality cost elements that identified above, it can be classified into four categories of quality costs, namely (a). Prevention costs are costs incurred to prevent damage to the quality of products itself. The company consists of the cost of prevention (1). Education and training costs are costs incurred by the Company to provide better education and training for prospective employees in order to improve the quality of human resources order to of improving the quality of its products. The cost of education and training is entered and recorded as cost of labor, (2). Maintenance costs of machinery and production equipment is the cost incurred by the Company to maintain and repair machinery and production equipment. It is intended that the production of machinery and equipment is maintained properly and can operate according to its function. Maintenance costs of machinery and production equipment are recorded as an entry and engine maintenance costs, (3). The cost of quality planning process in which each production process of company has always set standards of product qualifies firstly.

As a result, the companies have issued a number of costs, namely the quality of planning costs where costs are incurred for the Company's product quality standards to be produced. This entry costs and labor costs are recorded as such (a). Assessment costs are costs that occur in the measurement and data analysis to determine whether the products and services in accordance with the specifications. Assessment cost of the Company consists of: (1). The cost of raw materials is inspection costs incurred by the Company to inspect and test the raw materials to be used, whether in accordance with the standards set. The cost of this raw material incoming inspection and recorded as cost of labor, (2). The cost of the examination process is the pro-



**Table 4**  
**Cost of Quality Report Based on the Actual Sales Year of 2009 - 2011 (in Rupiah)**

Cost of quality category	2009	2010	2011
<u>Prevention Costs:</u>			
Education & training costs	63,902,400.00	63,582,074.00	63,966,574.00
Machinery & production equipment maintenance costs	57,201,937.00	98,756,584.00	42,647,578.00
Quality planning cost	60,826,511.00	42,638,293.00	64,773,378.00
Total of Prevention Cost	181,930,848.00	204,976,951.00	171,387,530.00
Percentage of Sales	1.11%	1.14%	1.07%
<u>Assessment Costs:</u>			
Raw material inspection cost	44,612,098.00	32,492,093.00	36,593,426.00
Production process inspection cost	78,302,831.00	63,823,829.00	57,829,373.00
Materials Inspection cost	23,751,087.00	34,029,375.00	41,138,379.00
Total of Assessment Cost	146,666,016.00	130,345,297.00	135,561,178.00
Percentage of Sales	0.85%	0.72%	0.85%
<u>Internal Failure Costs:</u>			
Scrap Cost	43,520,187.00	61,973,483.00	52,725,172.00
Rework Costs	83,785,423.00	69,202,393.00	56,292,302.00
Total of Internal Failure Cost	127,305,610.00	131,175,876.00	109,017,474.00
Percentage of sales	0.77%	0.73%	0.68%
<u>External Failure Costs:</u>			
Warranty costs	189,763,037.00	156,392,082.00	149,239,847.00
Sales returns and allowances	77,629,273.00	62,901,324.00	93,739,293.00
Total of External Failure Cost	267,392,310.00	219,293,406.00	242,979,140.00
Percentage of Sales	1.63%	1.22%	1.52%
Total of Cost of Quality	723,294,784.00	685,791,530.00	658,945,322.00
Percentage of Sales	4.40%	3.80%	4.11%
Actual Sales	16,440,166,857	18,047,145,526	16,032,732,895

Sources: Internal data processed.

duction costs for planning, coordinating, monitoring, and control during the production process takes place. Activities that use this cost starts from raw material preparation, cutting, making shoe soles, and sewing, pressing, refining, finishing and final control. The cost of this production process incoming checks and are recorded in cost of labor, (3). The cost of inspection of finished goods is the cost incurred by the Company to examine whether the products are compliant with the standards established company. This finished goods examination cost are entrance and was recorded as cost of labor, (4). Internal failure costs are costs that occur due to poor quality are found through the assessment before the product is delivered to the customer. Internal failure cost the company consists of: (a). Scrap or waste materials costs are costs incurred due to damage to the goods in the production process where the damage is a waste or not be repaired; (b). The cost of reworking the rework costs are costs incurred by the Company to rework products that fail to meet company standards and customer needs.

Report production costs in Table 3 was showed that the cost of other large companies. This is because the costs do not have a postal or a separate account by the Company's accounting cost items

which are placed on others. Examples of costs included in other costs as follows: (1). Processing costs are costs incurred by the Company to process raw materials and auxiliary materials into finishing goods in the process of making into finished goods. The cost of the rework process was not placed on this account because the rework process is included in direct labor costs, (2). Packaging costs are costs incurred at the Company's finished goods that have been packaged in accordance with purchase orders, (3). This is a storage cost covers the cost of storage costs for raw materials, in processing goods and finished goods that have been packed but are waiting/expecting to be sent to subscribers or consumers.

#### **Reporting Quality Cost Based on Actual Sales**

Cost reporting aims to improve the quality and ease of planning, control and managerial decision making. Cost reports not only show whether the quality of quality improvement has occurred or not, but it is useful to get an idea of whether the improvement of quality have been running or not.

The company's quality cost report for year 2009 - 2011 by using actual sales as the basis of the measurement are shown in Table 4 which conducting identification and classification and arranged in

the form of the quality cost report.

Table 4 shows that report quality costs before the control can be seen the total cost of quality has decreased in 2010 compared to 2009 amounting to Rp. 37,503,254 Then in 2011 the cost of steadily declining quality of Rp. 26,846,208 compared to the year 2010. If management only views the report without further analysis the Company will assume the cost of quality was controlled. This gives rise to losses for the company because it has not necessarily decreased cost of quality is accompanied by an increase in the cost efficiency of the Company. This can be seen in the total costs of prevention has decreased from year to year but on the contrary increased the cost of external failures that cost efficiencies could not be reached. This proves that the Company has not made a good quality cost control so that the quality of the resulting product can not be increased and the company is not standards-compliant companies and consumers. In this case the researchers wanted to help the company to control the cost of quality to achieve the ideal percentage.

#### **Planning and Controlling Costs of Quality Made by Researchers to the Company**

By planning and continuous quality control costs are expected to obtain good results from the management of activities undertaken to achieve a pre-determined quality, so that the resulting product can satisfy the consumer. Company management party should do a quality planning and control costs, companies also have to be able to plan specific actions needed to create better conditions for the next period. Follow-up of this formulation is the cornerstone of the quality cost report. This is because if the quality cost report is followed by a follow-up to a state that is reflected in the report, the reporting of quality costs is an activity that is useful and discards useless to increase the company's resources inefficiency operations. Further, in planning and controlling the cost of quality is the quality and cost analysis as a basis for making the appropriate decision-making by performing a detailed cost breakdown of the cost of quality previously reported as follows:

Breakdown of costs incurred in the Company's quality cost report for the year 2009 as follows:

##### **A. Prevention Costs**

###### **1. Education and Training costs include:**

- a. Cost of in Training Employees (per month):  
@ Rp. 480,715 x 30 peoples = Rp.14,421,450  
Total cost of employee training for 3 months is Rp. 43,264,350

###### **b. Cost of Employees Trainers (per month):**

@ Rp. 1,517,912 x 2 peoples = Rp. 3,035,824  
Total cost of employee trainer for 3 months is Rp. 9,107,472

###### **c. Cost of employees consumption in training period (per month)**

@ Rp. 128,118 x 30 peoples = Rp.3,843,526  
Total cost of employee consumption in training period is Rp. 11,530,578

Total Rp. 63,902,400

Note: This education and training is done by company once a year for 3 months.

###### **2. Machine Maintenance costs include:**

###### **a. Cost of Sewing Machine Maintenance Juki (per year)**

@ Rp. 9,997 x 110 units sewing machine x 19 times Rp. 20,893,730

###### **b. Cost of Press Machine Maintenance (per year)**

@ Rp. 9,679 x 96 units pressing machine x 19 times Rp. 17,654,496

###### **c. Cost of Smoothing Machine Maintenance**

@ Rp.9,917 x 99 units smoothing machine x 19 times Rp. 18,653,711

Total Rp. 57,201,937

###### **3. Quality Planning Costs include:**

###### **a. Procurement of new machinery and equipment costs Rp. 32,714,951**

###### **b. Meeting costs (4x213,147) Rp. 852,588**

###### **c. Controller's Wages of Quality Control**

@ Rp. 2,271,581 x 1 person x 12 times (a year)  
Rp. 27,258,972

Total Rp. 60,826,511

**Total of Cost Prevention is Rp. 181,930,848**

##### **B. Assessment Costs include:**

###### **1. The cost of raw material inspection**

- a. Shortage cost from the supplier  
@ Rp. 1,858,836x 24 times (a year)  
Rp. 44,612,058

###### **b. The cost of the production process inspection**

###### **2. Cost of production foreman**

These checks are carried out by three people every day in turn with the specified schedule and hours of the Company. While the waging system use direct labor hours are determined by tariffs 7,175/jam. Working hours required 30 hours per month. The labor is divided according to type of shoes a month and work for 26 days.

###### **a. Cost per foreman for 1 month:**

@Rp. 7175 x 10 hours x 26 days  
Rp. 1,865,500

Then the cost per month  
for 3 persons Rp. 5,596,500

Total payroll in one year

Rp. 5,596,500 x 12 times Rp. 67,158,000

b. Cost of Quality Control

Rp. 1,857,472 x 6 times a year Rp. 11,144,831

Total Rp. 78,302,831

3. Cost of finished goods examination includes:

a. Wages of the staff of finished goods examination

@ Rp. 50,751 x 15 people x 312 days

Rp. 23,751,087

**Total of Assessment Cost: Rp. 146,666,016**

#### **C. Internal failure costs include:**

1. Scrap costs (the residue) in one year Rp. 43,520,187

2. Rework costs

This rework costs are incurred because of defects before delivered to the consumer.

a. Manufacturing of shoe soles that do not fit the size

@ Rp. 364 x 30 hours x 15 people x 235 soles

Rp. 38,475,000

b. Installation of accessories which do not fit to the location

@ Rp. 360 x 30 hours x 12 people x 175 pairs

Rp. 22,360,320

c. Tailoring the shoes of the ill-fitting size

@ Rp. 297 x 30 hours x 12 people x 215 pairs

Rp. 22,950,103

Total Rp. 83,785,423

**Total of Internal Failure Cost: Rp. 127,305,610**

#### **D. External failure costs include:**

1. Warranty costs

a. The cost of maintenance that are still within the warranty period. For example, repair shoe soles, (a year)

@ Rp. 4,602 x 275 pairs x 150 consumer: Rp. 189,763,037

b. Returns and Sales allowances

Women's shoes @ Rp. 97,215 x 40 pairs x 10 consumers Rp. 38,886,000

Men's shoes @Rp. 104,716 x 37 pairs x 10 customers = Rp. 38,743,273

Total Rp. 77,629,273

**Total of External Failure Costs Rp. 26,739,231**

For three periods, the Company spends more than the cost of external failure costs of prevention and appraisal. The high cost of failure, especially external failure costs will affect consumer confidence in the company. Companies need to increase attention to the prevention or appraisal costs, because the high cost of failure of both in-

ternal and external means that there are many products made by the Company failed to keep trying to minimize the cost of failure and increase the cost of prevention or judgment by giving a greater increase in funding at the expense of education and training, cost of production machinery maintenance, and inspection costs. It is expected the production process can run optimally.

So with this researcher to assist the Company in charge of quality control by performing the analysis by way of increase or decrease of these costs in order to obtain a report showing the cost of quality and cost efficiency indicates the percentage of the Company's existing standards. That company must have a standard for quality cost report is not more than 2.5% of sales. Cost Control Measures Quality by researchers for the company in 2009 as follows:

#### **A. Prevention Costs**

2. Education and Training costs include:

a. Cost of in Training Employees (per month):

@ Rp. 480,715 x 40 peoples = Rp. 19,228,600

Total cost of employee training for 3 months is Rp. 57,685,800

b. Cost of Employees Trainers (per month):

@ Rp. 1,517,912 x 4 peoples = Rp. 6,071,648

Total cost of employee trainer for 3 months is Rp. 18,214,944

c. Cost of employees consumption in training period (per month)

@ Rp. 128,118 x 40 peoples = Rp.5,124,700

Total cost of employee consumption in training period is Rp. 15,374,160

Total Rp. 91,274,904

2. Machine Maintenance costs include:

a. Cost of Sewing Machine Maintenance Juki (per year)

@ Rp. 9,997 x 110 units sewing machine x 24 times Rp. 26,392,080

b. Cost of Press Machine Maintenance (per year)

@ Rp. 9,679 x 96 units pressing machine x 24 times Rp. 22,300,416

c. Cost of Smoothing Machine Maintenance

@ Rp.9,917 x 99 units smoothing machine x 24 times Rp. 23,562,792

Total Rp. 72,255,288

3. Quality Planning Costs include:

a. Procurement of new machinery and equipment costs Rp. 32,714,951

b. Meeting costs (2 x 213,147) Rp. 426,294

Total Rp. 33,141,245

**Total of Cost Prevention is Rp. 196,671,437**

**Table 5**  
**Productivity Ratio Calculation Year of 2009 - 2011 (in US Dollars)**

Description	2009	2010	2011
Sales	16,440,166,857	18,047,145,526	16,032,732,895
Cost of sales	1,107,227,747	1,349,428,310	1,476,093,419
Cost of quality	535,262,313	533,237,898	400,999,950
Ideal cost of quality (2,5% of actual sales)	411,004,171	451,178,638	400,818,322
Productivity Ratio	2.06	2.53	3.68

Sources: Company's data processed.

**B. Assessment Costs include:**

1. The cost of raw material inspection
    - a. Shortage cost from the supplier  
 @ Rp. 1,858,836x 24 times (a year)  
 Rp. 44,612,058
    - b. The cost of the production process inspection
  2. Cost of production foreman  
 These checks are carried out by three people every day in turn with the specified schedule and hours of the Company. While the waging system use direct labor hours are determined by tariffs 7,175/jam. Working hours required 30 hours per month. The labor is divided according to type of shoes a month and work for 26 days.
    - a. Cost per foreman for 1 month:  
 @Rp. 7175 x 10 hours x 26 days  
 Rp. 1,865,500  
 Then the cost per month  
 for 3 persons Rp. 5,596,500  
 Total payroll in one year  
 Rp. 5,596,500 x 12 times Rp. 67,158,000
    - b. Cost of Quality Control  
 Rp. 1,857,472 x 6 times a year Rp. 11,144,831  
 Total Rp. 78,302,831
  3. Cost of finished goods examination includes:
    - a. Wages of the staff of finished goods examination  
 @ Rp. 50,751 x 15 people x 312 days  
 Rp. 23,751,087
- Total of Assessment Cost: Rp. 146,666,016**

**C. Internal failure costs include:**

1. Scrap costs (the residue) in one year Rp. 43,520,187
2. Rework costs  
 This rework costs are incurred because of defects before delivered to the consumer.
  - a. Manufacturing of shoe soles that do not fit the size  
 @ Rp. 364 x 60 hours x 20 people x 170 soles  
 Rp. 37,128,000
  - b. Installation of accessories which do not fit to the location  
 @ Rp. 360 x 30 hours x 15 people x 112 pairs  
 Rp. 18,144,000
  - c. Tailoring the shoes of the ill-fitting size

@ Rp. 297 x 30 hours x 15 people x 116 pairs  
 Rp. 15,503,400

Total Rp. 70,775,400

**Total of Internal Failure Cost: Rp. 114,295,587**

**D. External failure costs include:**

1. Warranty costs
    - a. Returns and Sales allowances  
 Women's shoes @ Rp. 97,215 x 40 pairs x 10 consumers Rp. 38,886,000  
 Men's shoes @Rp. 104,716 x 37 pairs x 10 customers = Rp. 38,743,273  
 Total Rp. 77,629,273
- Total of External Failure Costs Rp. 77,629,273**

**Productivity Analysis Related to Cost of Quality**

In this section will be discussed about how to influence the cost of quality to increase productivity within the company. To control the cost of good quality will reduce costs of quality that occur within the Company therefore productivity will also increase due to the absence of errors in the production process and no longer damaged or defective products. Productivity is calculated by comparing the output generated by the Company with the costs of quality incurred as input. According to Hansen and Mowen formula productivity ratio (2001: 1010) as in formula (3). From the calculation of the formula (3) it can be seen the magnitude ratio of productivity at the expense of quality from 2009 to 2011 partially in Table 5. Table 5 shows that the level of productivity that is obtained after the application of the concept of quality costs can be a substantial increase in productivity when compared to the prior application of the concept of quality costs. This is because the concept of quality costs, the percentage of quality costs incurred by the Company has reached the ideal standard is 2.5% of actual sales. From productivity calculations above can be viewed by pressing quality costs incurred then the Company may increase productivity. In the year 2009 saw its productivity ratio of 2.06 and followed an increase of 2.53 in 2010 and in 2009 showed an increase in the ratio of the greater productivity that is 3.68.

An increase in the productivity ratio indicates an increase in the skills of workers who have received training and education. Skilled employees are increasing the production is causing the number of defective products or products fail to be slower and a bit of doing rework of the product. The increase is also not free from the increased costs of prevention.

So the quality is good cost control can boost productivity and save costs incurred by the Company which in turn can improve company profitability and image of the company's own products.

## 5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Based on data analysis and discussion in the previous chapter, it can be put forward some conclusions about the conditions that exist in the Company as follows: (1). The company already has been considerable attention on the importance of quality and data concerning the quality of existing cost. But the company has not introduced a system of recording and reporting of quality costs in particular as a means to remedy the quality of planning and cost control, (2). The Company does not set the standard for quality costs to be incurred each year so that the Company's cost control the quality of the actual sale cannot maximum, (3). The Company does not conduct further analysis of the reports that have been available to determine the cost of quality that occurred during the years 2009 until 2009, so the cost of the quality of the Company incurred no cost in accordance with the standards of quality in general is 2.5%. Thus, the actual sales can get achievement.

Caused by existing conditions on the Company, here are some suggestions that can be put forward for consideration for the managers of the Company in implementing cost control quality in an effort to improve cost efficiency and productivity of the Company, by way of: (1). Companies should make a special report quality costs, apart from reports that production costs can be known how many quality costs incurred by the Company and the extent to which the level of product quality has been achieved in each period, (2). It should be in charge of quality control, the Company set a standard for the cost of quality that should be removed without reducing the quality of the product to be produced. This should be in the evaluation of each period, (3). Control over the cost of quality should also be accompanied by increasing in sales, (4). Analysis of the cost of quality should be done so at the expense of quality control can improve

cost efficiency and productivity of the Company, (5). The need for heightened awareness that improved quality is the responsibility of all levels of employees in the company so that it is necessary to good cooperation and asks ideas from various parties therefore the quality improvement program can be run well.

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