Enhancing efficiency of production cost on seafood process with activity based management method

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Abstract. The efficiency of production costs has an important impact maintaining company presence in the business world, as well as in the face of increasingly sharp global competition. It was done by identifying and reducing non-value-added activities to decrease production costs and increase profits. The study was conducted at a company engaged in the production of squid (seafood). It has a higher product price than the market as Rp 50,000 per kg while the market price of squid is only Rp 35,000 per kg. The price of the product to be more expensive compared with market price, and thereby a lot more consumers choose the lower market price. Based on the discussions conducted, the implementation of Activity Based Management was seen in the reduction of activities that are not added value in the production process. Since each activities consumers cost, the reduction of nonvalue-added activities has effects on the decline of production cost. The production’s decline costs mainly occur in the reduction of material transfer costs. The results showed that there was an increase after the improvement of 2.60%. Increased production cost efficiency causes decreased production costs and increased profits.

1. Introduction

Business competition in the industrial world that becoming very intense, forces any company to have a high competitiveness to maintain its existence. Therefore, needed business strategies to win the competition among companies. A company can minimize its production costs through efficiency in non-value-added activities. Activities of an organization or unit can be said efficient if in the execution of it consumed fewer resources or lower costs to produce a greater amount of output, by reducing non-added-value activities. By reducing non-value-added activities, the costs of the production process will reduce and in turn, the reduction of production costs will increase the profit of the company [1] Packing industry of seafood products is one industry that has to prepare itself to implement that strategy. The XYZ company is an industry processing seafood products such as squids, crabs, prawns, tuna and other seafood products and each seafood product has its own processing plant. The price of processed squids of this company is Rp 50,000 per kg while the price in the market is only Rp 35,000 per kg. The company is facing an increase in production cost each year and consequently reduces the company’s profit. The price of the product to be more expensive compared with market price, and thereby a lot more consumers choose the lower market price.

Activity Based Management (ABM) is an integrated approach in the whole system, which focused the management’s attention on the various activities, with the goal to increase value for the customers and in turn increase profit as its result [2]. Activity based management is putting efforts to identify and
in the end to abolish all non-added-activities and at the same time focused the management’s attention on the needed activities to increase value for the customers (cost value) and in turn increase profit.

The success of ABM depends on the business unit being used. ABM method research is used at the organizational Life Cycle Stage (OLC). Variables used in this study: business unit maturity, birth, growth and decline. The result shows that ABM business maturity level is higher than other variables in OLC [3]

In this study discussed the use of Activity Based Management in a fictitious company Business-to Customer (B2C). Initially the company must determine the purpose of the research. Variables used in this study are Objectives, requirements and cost objects. The analysis used is by using matrixes in order to trace overhead, resulting in a proposed implementation procedure of this study [4]

The main purpose of this study is to determine the scientifically designed the financial costs of each model that has been established. In this study combined the financial model of activity-based cost system with financial model of the standard cost system. It also calculates the integration of the advantages of the two models. This research covers the entire production and operation process from start to finish. In this study used the R & D expenses as the accounting starting point. And after-sale service expenses as the terminal point. This research is conducted in China because the development of production in China is at the stage of mechanical and semi-automation [5-6]

In this study compared traditional systems with Cost of Quality (COQ) system oriented Activity Based Costing. COQ is a tool used to measure company performance. This research attempts to analyze the shortcomings of traditional methods by using the advantages of the activity based costing method. Activity based costing is an alternative to overcome the weaknesses of traditional systems so that the results obtained the detailed cost of quality according to the case studies taken. The weakness of this research is limited to high priority process that is functional opinion management, so it has a bad risk and data quality [7-8]

2. Methodology/Experimental
The conducted research belongs to the applied research. Applied research is basic research in solving a real existing problem [9] In this research an analysis of factual situation and variables of a certain object was conducted, compare them with a condition, situation or variables that been set for the object of research, and then find the solution by reducing the non-added-value activities in the company, so that the production cost will be efficient.

2.1. Data Collection Methods
The technic of data collection in this research, started with conducting observation by direct observing the actual activities in processing squids and counting the time of production process directly by using Stopwatch. The next step is conducting interviews with the management and the operators that work in the company concerning all things connected with the research object and to complete data collected by observation. Alongside, documentation was conducted by collecting secondary data within the company, that is data related to the research being conducted.

2.2. Data Processing Methods
The technic of data processing in this research, begins with the identification of all activities that happen during the production process. Identification of activities was conducted on the activities in packing the marine products, particular squids by setting up the flow process chart. Classification of activities was done by dividing the company activities in two that is those that have value-added and those that do not have value added. The classification of activities is conducted by using process value analyses that consist of value-added activities and non-value added activities. The allocation of production costs to each activity is being done to find out the cost of each activity allocated by the company during the process. The allocated cost was defined by measuring cycle time, needed space,
and other needs of the plant in advance. Activities analyses are the key to reach the goal efficient costs. Activities analysis is a process of elimination, reducing non-value-added activities to reduce production costs of the company.

3. Results and Discussion

3.1. Business Process

The aim of business process analysis is to map out various activities conducted by XYZ company to produce output and at the same time provide information related to resource driver, activity resource, value and non-value added activities. Aside of that, the business process analysis are also aimed at finding out various opportunities for improvement of the process practiced by the company in producing value for the consumers.

Business process analysis consist of 4 stages as follows:

a. Business Process Identification.

The identification process is conducted to identify the whole processes that exist in the company business. The activities in a company are so complex, that it will be necessary to decide the business process that being the priorities of the management of this company. The analysis tool that was used in the diagram value chain as illustrated in Figure 1.

![Figure 1. Diagram Value Chain for Business Process Identification](image)

b. Sub-Process Identification

From the above-described steps, it was found that most activities are in the production process, and the goal of the company is to produce squids with low production cost. Subsequently, analysis will be centered on the production section, and then continue to identify the sub process in the production process that can be seen in Table 1 below:
Table 1. Sub Processes in Production Section

| Business Process | Sub Process                        |
|------------------|-----------------------------------|
| Production       | Steaming Process                  |
|                  | Peeling Process                   |
|                  | Filling and Weighing Processes    |
|                  | Freezing Process                  |
|                  | Cooling Process                   |
|                  | Packing Process                   |
|                  | Coding Process                    |
|                  | Labeling Process                  |

3.2. Cost Driver Analysis
Cost Driver Analysis is used to find out the driver of costs consumption. Cost driver analysis can be seen in Table 2 below.

Table 2. Activities, Activities Level and Cost Driver

| Activities                | Activities Level | Cost Driver                  |
|---------------------------|------------------|------------------------------|
| Material Cost             | Batch            | Total Amount Consumed        |
| Direct Labor Cost         | Batch            | Total Direct Labor           |
| Supporting Material Cost  | Batch            | Total Amount Consumed        |
| Electricity Cost          | Batch            | Total Kilowatt Hours         |
| Water Cost                | Batch            | Water Usage                  |
| Handling Cost             | Batch            | Amount of Goods being Handled|
| Costs of Machine and Tools| Unit             |                              |
| Maintenance               |                  | Direct Allocation            |
| Labor Insurance           | Unit             | Direct Allocation            |
| Plant Building Insurance  | Unit             | Direct Allocation            |

3.3. Defining Allocation for Standard Wages
The improvement that can be made is by defining a transparent and universal wages standard for labor. This can be done by using Merit Pay System, that is wages are based on performance and length of time in performing one task that can be seen in Table 3.
Table 3. Allocation of Merit Pay Wages

| Activities  | Starting Wages (Rp) | UC (Rp) | UM (Rp) | UC (Rp) |
|-------------|---------------------|--------|--------|--------|
| Steaming    | 87                  | 1.13   | 73.3   | 83     |
| Peeling     | 75                  | 1.12   | 73.3   | 82     |
| Filling     | 85                  | 1.09   | 73.3   | 80     |
| Weighing    | 60                  | 0.81   | 73.3   | 59     |
| Freezing    | 59                  | 0.77   | 73.3   | 56     |
| Cooling     | 26                  | 0.41   | 73.3   | 30     |
| Packing     | 25                  | 0.20   | 73.3   | 15     |
| Coding      | 17                  | 0.35   | 73.3   | 26     |
| Label       | 57                  | 0.94   | 73.3   | 69     |
| Total       | 500                 | 6.82   | 73.3   | 500    |

3.4. Value Process Analysis

At this stage, various activities that formed the sub process are defined according to the value considered by the customers. Each activity in each sub process will be divided into three categories: value-added activity and non-value-added activity. According to Hansen and Mowen, there are many criteria that can be used to define whether an activity adds value or not. The result of the above-mentioned categorized activities shows that the total production activities in this company are 20 activities consist of 14 value-added activities and six non-added value activities. From all those categories of activities is found out that the handling of the material is non-value-added activities.

3.5. Improvement Process

At this stage, efforts are taken to improve each activity of each sub process in producing squids. Added value and non-added value activities are analyzed to find out which of these two categories indicate wastage that being practiced by the company. After knowing the aim of the company in conducting those activities, the next step is to find the solution for the existing problems.

3.6. Material Handling Analysis

Actions proposed to minimize the cost of material handling is to shorten the distance between work-centers. Minimizing the distance is done by calculating the distance between activities in the work-center, so that related activities are close to each other. By taking this actions, handling distance is shorter than the actual condition. The difference of handling distance in actual condition and the propose condition can be seen in Table 4 below.

Table 4. Shortening Distance

| Condition | Distance (m) | Shortened Distance (m) |
|-----------|--------------|------------------------|
| Actual    | 291.25       | 87.53                  |
| Proposed  | 113.72       |                        |

3.7. Production Costs Efficiency

Costs reduction that occurred by shortening the handling distances has an impact on the total cost spent by the company. Handling distances needed by the worker are shortened, and thereby costs of direct labor for hauling activities are also lower. Comparison between the cost of hauling activities at actual and proposed condition can be seen in Table 5 below.
Table 5. Cost of Squids Transportation

| Actual Condition (Rp) | Proposed Condition (Rp) |
|-----------------------|-------------------------|
| Rp 242,155,000,00     | Rp 39,496,653,00        |

From Table 5 it is seen that total costs spent by the company for handling activities at actual condition are Rp 242,155,000.00. After improvement of hauling distances, costs spent by the company are Rp 39,466,653.00 less than then actual condition costs. Saving occurred in direct labor costs for hauling activities, and consequently reducing the total costs of production. Comparison between production costs at the actual condition and production costs after improvement can be seen in Table 6 below:

Table 6. Recapitulation of Financial and Non-Financial Performances

| Situation Indicator | Costs                      |
|---------------------|----------------------------|
| Actual              | Rp 36,848,218,000.00       |
| Proposed            | Rp 35,889,280,653.00       |

From Table 6 it can be seen that direct labor costs are reduced. This also means a reduction of production costs. The costs to produce squids at actual condition are Rp 36,848,218,000.00; with costs saving amounted to Rp 958,937,347.00, thereby the actual costs spent in producing squids are reduced amounted to Rp 35,889,280,000.00.

The calculation of costs efficiency as result of improved activities is as follows:

Original Production Costs  Rp. 36,848,218,000.00
Proposed ABM Production Costs Rp. 35,889,280,653.00
Reduction of Costs         Rp.         958,937,347.00

4. Conclusion.
From all data processing and analysis and taking into consideration the aim of this research, it can be concluded that material handling activities are activities that do not have any added value. Therefore costs saving that can be achieved by the management of this company is by minimizing the hauling distances, so that the reduction of production costs amounted to Rp 958,937,347.00. Consequently, an efficiency increase of 2.60% is achieved. With the increase of production costs efficiency, the production costs will be reduced, and in turn, the profit of the company will increase. Aside of that, the other benefit gained by the company is the increase of product value in the eyes of the consumers. By that, the company will be able to win all aspects of competition. The proposed improvement for material handling is regarding the capacities of transportation equipment and shortening hauling distances. Alongside with minimizing material hauling distances, the allocation of wages should also be improved based on performance and there by justice will be achieved.

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