

Determination of production cost with activity based costing at PT. XYZ

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Abstract. Cost is the price used or sacrificed in order to earn revenue and will be used as income deduction. At the beginning of the initial cost accounting is only intended for the determination of the cost of products or services produced, but with the increasing importance of non-production costs, namely marketing costs and general administration, cost accounting is currently intended to provide cost information for both production cost management and non-production costs. Activity-Based Costing (ABC) is a system that is a cost calculation approach that focuses on activity as a fundamental cost object. The ABC system uses the cost of such activities as a basis for allocating costs to other cost objects such as products, services or customers. In the cost system of activity based costing, the product is defined as goods or services that the business is trying to sell, including health services, insurance, bank loans, consulting services, gasoline, cinema, bread, and others. All of the above products are generated through the company's activities and these activities consume resources.

1. Introduction

To achieve the economic progress of a country cannot be separated from the role of banking where one of the role of banking as an intermediary function is to collect and channel funds. Since the 1997 monetary crisis, the establishment of the IBRA (National Bank Restructuring Agency 2004 and the ending of the banking recapitulation process, the reorganization of Indonesia's bureaucracy has begun, in particular, is aimed at strengthening resilience in realizing banking stability to cope with the various crises that could affect banks. that, with the wider reach of banking operational activities in the era of globalization in various areas of economic development, the need for signs in its control.

The current economic situation is very influential on the survival of a company. This requires the company management to be more efficient and competitive by applying the right strategy in running the company and create a sustainable competitive advantage. In addition, the company must have a high competitiveness that is related to quality, delivery costs and services.

Likewise with the determination of production costs, should be applied a system that is able to maintain the profit margin of the company and can control the change in production costs are too high. It requires a detailed cost system to identify activity that generates costs and determines the cost. The system that provides that information is activity based costing.

In determining the cost of product sometimes PT. XYZ still uses traditional cost accounting. Where this system does not correspond to an advanced manufacturing environment. Product costs generated by traditional cost accounting systems provide distorted cost information.



Distortion arises because of inaccuracies in the imposition of costs, resulting in costing errors, decision-making, planning, and control. The distortion also results in

With the development of science, then in the 1800s and early 1900s was born an activity-based costing system based on activities designed to overcome the distortions in traditional cost accounting, this accounting system called activity-based costing.

The main difference between the cost of product costing between traditional cost accounting and ABC is the amount of cost drivers used. In the product costing system by the ABC method it uses more cost drivers than in traditional cost accounting systems that only use one or two cost drivers [1].

In the ABC method assume that the incidence of costs is caused by the activity produced by the product. This approach uses cost drivers that are based on cost-generating activities and will be better applied to companies that produce product diversity.

PT. XYZ is one of the manufacturing companies that produce diversity of products. Where output is sold more than one. Product diversity at PT. XYZ resulted in a large number of costs and activities occurring, thereby demanding the accuracy of overhead charges in determining the cost of the product. The ABC method is assessed to accurately measure the costs that come out of each activity. This is due to the cost driver used in overhead loading, so in the ABC method can increase the accuracy in cost details, and the accuracy of loading

2. Literature Review

Cost is the price used or sacrificed in order to earn revenue and will be used as income deduction. At the beginning of the initial cost accounting is only intended for the determination of the cost of products or services produced, but with the increasing importance of non-production costs, namely marketing costs and general administration, the current cost accounting is intended to present.

Costs can be classified into two sections [2]:

1. Categorization of costs based on the tendency of changes to activities
 - Fixed costs (fixed costs), ie costs that the amount remains constant, no influenced by changes in the volume of activity or activity up to a certain level.
 - The variable cost (variable cost), is the total cost will change in proportion to the volume of activity, the greater the volume the higher the total variable cost and otherwise.
2. Classification of costs by object or cost center financed
 - Direct costs, is the cost of occurrence or benefit can be identified directly on a particular object or cost center.
 - Indirect cost is the costs incurred cannot be identified on an object or cost center, or a cost that benefits are enjoyed by several objects or cost centers..

In traditional cost systems it can be seen that the costs involved are usually only direct costs, is labor costs and which can be classified into direct costs [3]. The costs are like the cost of care, and so forth. The traditional cost system would impose an indirect cost on an unrepresentative allocation basis. In traditional cost systems, in allocating indirect plant costs to production units.

Activity-Based Costing has been developed in the organization as a solution to problems that cannot be solved well by traditional cost systems [4]. Some cost management experts provide a definition of the Activity-Based Costing cost system as follows.

Table 1. Defenition of Activity Based Costing

No	Name	Defenition
1.	Wayne J. Morse, James R. Davis dan A. L. Hartgraves (1991) [5]	Activity-Based Costing is a system of allocating and reallocating costs to cost objects on the basis of activity that causes costs.
2.	Ray H. Garisson (1991) [6]	Activity-Based Costing (ABC) is a cost calculation method that creates a cost group for each event or transaction (activity) within an organization that serves as a cost driver.
3.	Douglas T. Hicks (1992)[7]	Activity-Based Costing is a cost accounting concept based on the idea that the product consumes activities and activities that generate costs
4.	L. Gayle Rayburn (1993)[8]	Activity-Based Costing is a system that recognizes that the execution of activities leads to the consumption of resources that are recorded as costs, or in other words that ABC's cost system is a cost-based calculation approach based on transactions
5.	Charles T. Horngren, Gary L. Sundem dan William O. Stratton (1996) [9]	Activity-Based Costing is a system that is a cost calculation approach that focuses on activity as a fundamental cost object.
6.	Michael W. Maher (1996) [10]	Activity-Based Costing is a cost calculation method that charges first on activity, then on product based on activity usage by each product.

The benefits of ABC costing system for the management company [11] :

1. An ABC cost system review can convince management that they must take a number of steps to become more competitive.
2. The management will be in a position to make an offer more reasonable competition.
3. ABC cost system can help in decision making (management decision making) that the management must do, besides with more accurate cost determination then the decision will be taken by management will be better and precise.
4. Supporting continuous improvement, through activity analysis, ABC systems allow for action of elemination or improvement of activities that are not value-added.
5. Facilitate the determination of less cost-relevant costs, on traditional systems many of the less relevant hidden costs.
6. With an improved cost analysis, management can perform a more accurate analysis of the volume of production required to break even for low-volume products.

To be able to implement activity-based costing required steps. According to Garrison and Noreen stages to implement activity-based costing are [12]:

1. identify and define activity and activity pool
2. track activity overhead costs
3. charge pool fee to activity cost
4. calculation of activity tariff
5. charge the object by using activity rate and activity size
6. preparing management reports

Production overhead costs cannot be directly identified to products that use them or consume them. This is different from direct production costs that can be identified directly to products that consume them [15]. Cost drivers are the factors that cause changes in activity costs [14]. The determination of production overhead cost with traditional system can be seen

in figure 1, while determination of production overhead cost with Activity-Based Costing (ABC) cost system can be seen in figure 2.

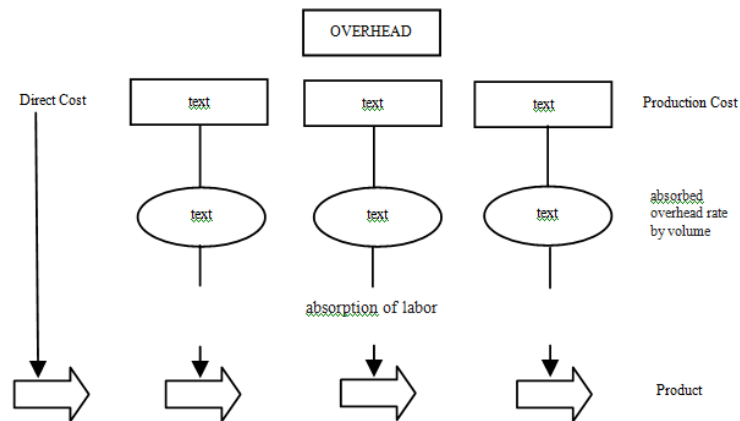


Figure 1. Traditional System

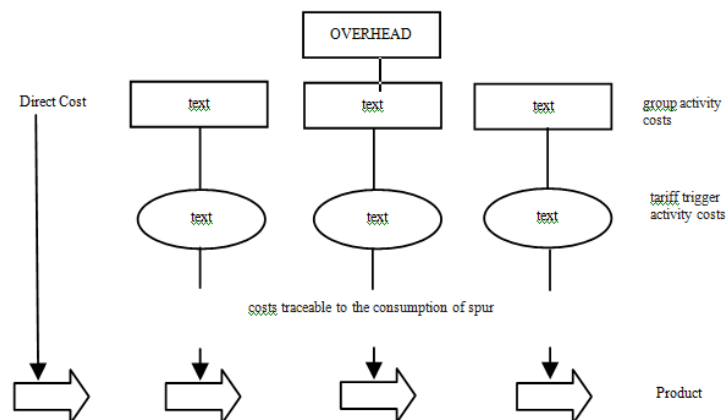


Figure 2. ABC System

Product driven activity can be grouped into four categories, namely:

1. Unit-level activities
2. Batch-level activities
3. Product-level activities
4. Facility-level activities

3. Methodology

The data collection methods used are:

1. Data collection steps
 - Identification of products to be investigated at the time of the study
 - Determination of research objectives

- Grouping production costs into direct material costs, costs indirect labor and production overhead costs.
2. The method used
 - Conduct a direct observation of the object of research with see the production process of making the product to be studied.
 - View and record from administrative books and notes the company associated with the required data.
 - Make use of historical data, record and study the files with respect to production costs at PT. XYZ.
 - Conducting discussions and interviews with parties that can provide the information needed to facilitate the solution problems encountered.
 3. Data Source
Source of data obtained from the documentation and records that exist in the PT. XYZ
 4. Data Type
 - Primary data is data derived from the results of direct measurement on object of research. Primary data required is activity data manufacture of CIRP fertilizer
 - Secondary data is data obtained from records, reports and books / related agencies.
 5. Data processing
The steps needed in data processing can be seen as the following:
 - Determination of production cost using traditional method
 - Determination of production cost by using activity based method costing

4 . Discussion of Result

Classify the cost activity into various activities in the intent to make it easier in costing and determining cost drivers as shown below:

1. Based on the unit level activities, this activity is done for each unit production.
2. Based on batch related activity cost, activity is done every batch processed, the activities included in this category are usage fee solar.
3. Based on activity level products, related to specific products and usually done regardless of how many batches or units are manufactured or sold. In the process of making this fertilizer is not found.
4. Based on facility level activities, activities that support the company's operations but many of these activities are not related to volume. Some of the activities included in this category are reparations, parts purchases, and depreciation

Table 2. Classification of Costs into Various Activities

cost elements	Amount (Rp)
<i>Unit level activity</i>	
Cost of raw materials	14.741.000.000
The cost of additional materials	166.281.000
Indirect labor costs	76.500.000
Electricity cost	16.287.352,13
Direct labor costs	31.000.000
Freight costs	20.000.000
<i>Batch related activities cost</i>	
the cost of oil and lubricant use	7.400.000
<i>Facility sustaining activity cost</i>	
Cost of reparation	17.916.836
Cost of purchasing spare parts	5.114.000
Depreciation expenses	54.763.251,17
Total Cost	15.739.012.709

After these activities are identified in accordance with the category, the next step is to identify the cost driver of each activity cost. This identification is intended in the determination of activity groups and tariff / unit cost drivers. The grouping of CIRP fertilizer production cost and cost driver can be seen in table 3.

Table 3. Grouping production costs of cirp fertilizers and cost drivers

No.	Activity	Driver	Cost Driver	Amount (Rp)
1	<i>Unit Level Activity Cost</i>			
a.	Cost of raw materials	the amount of raw materials in tons	5351	14.741.000.000
1.	CIRP Australia	the amount of raw materials in tons	2624	
2.	CIRP Mesir	the amount of raw materials in tons	2727	
b.	The cost of additional materials	the amount of raw materials in tons	5351	166.281.000
1.	CIRP Australia	the amount of raw materials in tons	2624	
2.	CIRP Mesir	the amount of raw materials in tons	2727	
c.	Indirect labor costs	total manpower	18	76.500.000
1.	Director of the factory	total manpower	1	
2.	Production Section	total manpower	5	
3.	Engineering section	total manpower	5	
4.	Warehouse section	total manpower	3	
5.	Material Section	total manpower	4	
d.	Electricity cost	Kwh	449.05	16.287.352,13
1.	Hammer machine mil 1	Kwh	187.5	
2.	Hammer machine mil 2	Kwh	187.5	
3.	Sewing machine	Kwh	3.8	
4.	warehouse and office lighting	Kwh	18.75	
5.	Water pump	Kwh	18.75	
6.	Air cond. office	Kwh	14	
7.	Welding machine	Kwh	18.75	
e.	Direct labor costs	working hours	800	31.000.000
1.	CIRP Australia	working hours	400	
2.	CIRP Mesir	working hours	400	
f.	Freight costs	the amount of raw materials in tons	5351	20.000.000
1.	CIRP Australia	the amount of raw materials in tons	2624	
2.	CIRP Mesir	the amount of raw materials in tons	2727	

Table 4. Tariff of production cost of Egyptian CIRP processing fertilizer

Activity	Tariff cost driver (Rp)	Driver	Total Cost (Rp)
cost of raw materials	2754812.2	2727	7512372828
the cost of additional materials	31074.752	2727	84740849.75
indirect labor costs	4250000	18	76500000
electricity cost	36270.687	210.05	7618657.866
direct labor costs	38750	400	15500000
freight costs	3737.6191	2727	10192487.39
the cost of oil and lubricant use	3700	1600	5920000
the cost of repairs	14930.697	800	11944557.33
cost of purchasing spare parts	4261.6667	800	3409333.333
building depreciation expenses	226717.71	20	4534354.17
facility depreciation expenses	797288.37	43	34283399.7
Total production cost CIRP Mesir			7767016467
Amount of production (Kg)			2727000
Production cost per Kg			2848.190857
Production cost per sack (50kg)			142409.5429
Expected profit			569.6381714

Table 5. Tariff of production cost of Australian CIRP processing fertilizer

Activity	Tariff cost driver (Rp)	Driver	Total Cost (Rp)
cost of raw materials	2754812.185	2624	7228627172
the cost of additional materials	31074.75238	2624	81540150
indirect labor costs	4250000	18	76500000
electricity cost	36270.6873	210.05	7618657.9
direct labor costs	38750	400	15500000
freight costs	3737.619137	2624	9807512.6
the cost of oil and lubricant use	3700	1600	5920000
the cost of repairs	14930.69667	800	11944557
cost of purchasing spare parts	4261.666667	800	3409333.3
building depreciation expenses	226717.7085	20	4534354.2
facility depreciation expenses	797288.3651	43	34283400
Total production cost CIRP Australia			7479685138
Amount of production (Kg)			2624000
Production cost per Kg			2850.4898
Production cost per sack (50kg)			142524.49
Expected profit			570.09795

Table 6. Comparison of production cost fee by using traditional methods and ABC

Cost elements	Traditional fare	ABC fare
<i>Unit level activity</i>		
cost of raw materials	14.741.000.000	14.741.000.000
the cost of additional materials	166.281.000	166.281.000
indirect labor costs	76.500.000	153.000.000
electricity cost	16.287.352,13	15.237.315,73
direct labor costs	31.000.000	1.000.000
freight costs	20.000.000	20.000.000
<i>Batch related activities cost</i>		
the cost of oil and lubricant use	7.400.000	11.840.000
<i>Facility sustaining activity cost</i>		
the cost of repairs	17.916.836	23.889.114,67
cost of purchasing spare parts	5.114.000	6.818.666,667
depreciation expenses	54.763.521,17	77.635.508
Total costs	15.739.012.709	15.246.701.605

The cost of this raw material is direct production cost, the amount of material cost to produce Egyptian CIRP fertilizer is 2727 tons using the method used by the company is IDR. 8.181.000.000. Meanwhile, when calculated using the Activity based costing method is IDR. 7.512.372.828. The cost of raw materials to produce CIRP Australia as much as 2624 tons using the method used by the company is IDR. 6.560.000.000, while using the Activity Based Costing method that is IDR. 7.228.627.172.

The old system imposes direct labor costs throughout the product on the basis of production quantities. This old system considers that direct labor cost per unit of product is the same, the amount of direct labor cost of CIRP processing of Egypt and Australia IDR. 31.000.000. In this Activity-Based Costing System method, direct labor cost is more accurate because the cost is differentiated based on operator's working hours. The cost of direct labor for the processing of Egyptian CIRP fertilizer is IDR.15.500.000 while the direct labor cost for the processing of Australian CIRP fertilizer is IDR.15.500.000, so the total cost for processing both types of fertilizer is IDR. 31.000.000.

The old system charged the cost of electricity to all products evenly based on the total production of June 2016 that is IDR. 16.287.352,13. This old system assumes that the cost of electricity per unit of product is the same for each machine. The cost of electricity for the processing of Egyptian CIRP fertilizer using Activity-Based Costing System is IDR.7.618.657,866 The cost of electricity for the CIRP processing of Australian fertilizer is equal to the cost of processing Egyptian CIRP which is IDR.7.618.657,866

The old system imposes the cost of lubricating oil and diesel fuel throughout the product evenly based on total production in June 2016. This old system assumes that the cost of diesel per unit of product is the same for each machine that is IDR. 7.400.000. The cost of diesel fuel for the manufacture of Egyptian CIRP and CIRP fertilizer using Activity-Based Costing System is IDR. 5.92 million

5. Conclusion

The conclusions obtained from the research conducted at PT.XYZ are as follows:

1. The system of production cost determination company by using traditional method for CIRP product as much as 5351 ton in can be equal to IDR.15.678.856.342. where the inclusion of production costs using such traditional methods does not reflect the accurate production costs and actual production cost of consumption because the cost of production is only based on the volume of products produced. This system assumes the inclusion of evenly distributed production costs to the product produced during a certain period.
2. The imposition of indirect labor costs suffered a price distortion of IDR.76.500.000. This occurs because the charging cost traditionally imposes on the basis of the volume of producers, while the activity based costing method is based on the number of hours of activity generated by the manufacture of CIRP fertilizer of 5351 tons.
3. The charging of electricity costs has a distortion of IDR. 1.050.036. This occurs because the cost of charging is traditionally charged based on the volume of producers, while the activity based costing method is based on the number of machine hours / Kwh generated by the manufacture of CIRP fertilizer of 5351 tons.
4. The imposition of oil and lubricant costs experienced a price distortion of IDR. 4.440.000. This occurs because the cost of charging is traditionally charged based on the amount of production volume, while the activity based costing method is based on the number of machine working hours required for the manufacture of CIRP fertilizer of 5351 tons.
5. The imposition of reparation costs has a distortion of IDR. 5.972.279. This occurs because the cost of charging is traditionally charged based on the amount of production volume, while the activity based costing method is based on the number of machine hours produced by the manufacture of CIRP as much as 5351 tons.

6. The cost of purchasing spare parts has a distortion of IDR.1.704.667. This occurs because the charging cost traditionally imposes on the basis of the volume of producers, while the activity based costing method is based on the number of machine working hours generated by making CIRP as much as 5351 tons.
7. The imposition of depreciation expense has a distortion of IDR. 22.871.986,57. This occurs because the charging cost traditionally imposes on the basis of the amount of producer volume, while the activity based costing method is based on the number of machine hours produced by the manufacture of CIRP fertilizer of 5351 tons.

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