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Utilization of Activity Based Costing Method to Calculate the Cost of Production and Evaluate Profit
(Case Study at PT. Ionuda Sidoarjo)

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ABSTRACT: *This research was conducted at a manufacturing company, PT. Ionuda. The purpose of this study is to apply the method of calculating costs based on the calculation of the cost of production and how the calculation of the cost of production of profits obtained by the company. This research uses qualitative approach with a case study method. The results of this research show that first, the use of the Activity Based Costing method in calculating the cost of production imposes overhead costs based on the activity needs of each product resulting in a more accurate and informative cost of production. Second, calculation of cost of production with the Activity-Based Cost Calculation method does not change the profit obtained by the company, only the profit contribution of each product becomes different.*
***Key words**: activity-based costing, cost accounting, cost of productions, profit evaluation*

INTRODUCTION

In this era of globalization, the rapid development of the world resulted in competition in the industrial sector. The company must face business competition that not only occurs locally but also happens in the international arena. Intense competition in the business sector is causing the company to improve products' quality and use a particular strategy to compete. Nuzulita et al. (2020) suggest that the company must maintain its accounting management to be competitive in the turbulent era. One of the accounting management is the implementation of activity-based-costing. Generally, the company has a goal to obtain maximum profit. Various challenges must be faced by the company so that its objectives can be achieved. There is a tough competition that demands the company to set a competitive selling price, so it is necessary to calculate the price of essential products following the realization of costs charged on the resulting product.

Companies that produce various types of products with diverse production processes cause the difference in cost – the cost of one product with the other. Based on research conducted by (Santoso 2015) on cooperative marketing cooperatives "KPUB" cow Jaya Kandangan, classification of fees according to the group fee is required to calculate the price of the production tree can then be used to calculate the appropriate selling price. Therefore, the enterprise requires determining the price of a product that describes the cost – the cost according to each product's absorption, resulting in an accurate product base price. Product price calculations play an important role for the company. An error in the underlying price calculation will cause harm the company, so that the underlying price calculation can help managers in decision making.

PT. Ionuda is a company engaged in the manufacturing industry that produces various components of cars. The company is located on JL. Kh. Mukmin Gedangan baldness RT 02 RW 02 Sidoarjo. Every month, the demand for the produced goods is always increasing, but the company's profit does not match what is expected. It shows the earnings table on one of the products manufactured from 2015 to 2017 as follows:

Table 1. Cost and profits obtained by **Inner Pipe** Products

Years	Product Unit	Sales (RP)	Cost (RP)	Profit earned (RP)
2015	3.089	756.805.000	674.282.365	82.522.635
2016	4..763	1.166.935.000	954.529.015	212.405.985
2017	6.563	1.607.935.000	1.473.518.197	134.416.803

Source: Company Data

Table 1 shows that the increase in units produced in 2015-2017 does not make the company's profits increased. The profit earned by the company in the years 2015 – 2017 suffered a decline. Earnings gains that are always declining can threaten the survival of the company. The company needs to evaluate its price calculation and the production cost to obtain the right product price.

In its operations, the company produces various types of products through different stages in its completion, resulting in costs – costs beyond raw materials and direct labor that also support the product's completion. Therefore, it is necessary to allocate accurate costs to the product based on resources consumed due to various activities that will eventually result in the product's underlying price.

PT Ionuda still uses the traditional counting method to allocate overhead costs. In the traditional cost accounting system, giving overhead is often done carelessly. The overhead charge is determined based on the number of units produced as the cost load. One of the main disadvantages of traditional methods is using a single tariff overhead plant costs, such as rates based on direct working hours or using a volume-based uncharged volume rate, such as rates based on machine hours or direct material costs for different products, volumes, and processes. This tariff generates inaccurate product costs if there are many factory overhead costs. The set-up and material handling are not a volume-based cost volume if the company manufactures products with high product diversity and different volumes, sizes, and complexities.

Allocating overhead can be done using the Activity Based Costing method. The activity-based costing method is a cost accounting method that focuses on organizational Activity and the collection of costs – costs based on the underlying properties. Some predefined overhead levels are then calculated using a wide range of cost triggers in an organization's Activity.

The use of the Activity-Based Costing method is backed by the company's efforts to increase the efficiency in calculating the cost of products, especially for manufacturing companies that generally produce many products. Companies often face the problem of loading costs to the products created. The Activity-Based Costing method is designed with the fundamental belief that costs can only be significantly reduced by managing the cause of cost, i.e., activity. Activity management aims to direct all organizational Activity to the provision of products to benefit consumer needs.

Based on Rumampuk Research (2013), Tandiontong (2012), and Rahmaji (2013) showed that the Activity Based Costing method resulted in a more accurate cost calculation compared to traditional methods. Products with high volumes on a traditional counting method report higher per-unit cost and lower cost per unit for low volume products. This low cost is due to the allocation of the entire overhead based on volume. If the effect cannot reflect the actual cost absorbed to produce the product, it will cause many problems in the cost of production.

Lepar et al. (2014) has researched manufacturing companies engaged in the coffee industry. The application of an Activity-Based Costing system in calculating the price of production products can charge a fee in each type of product according to the cost of large consumption. There is no charge in any type of product over costing undercoating. The accuracy of the cost of the product can help in determining the right selling price.

Based on table 1, sales of Inner pipe Products in the year 2017 increased by 38%, but its profit decreased by 36%. This percentage indicates that there is a chance that the company has encountered an error in allocating costs so that the underlying price calculation is inaccurate. Such data researchers are interested in calculating the price of production base by Activity Based Costing method and evaluating the company's profit.

LITERATURE REVIEW

Decision-Making theory

According to Terry (2014), the definition of decision-making is an alternative selection of behaviors from two or more alternatives. Decision-making can be regarded as a result of an output of a mental or cognitive process that leads to selecting a course of action among several options available. The result can be an action or an opinion of the selection. A decision-making process always results in a final choice.

Cost

According to Hansen (2015), cash sacrifice or cash equivalent to obtaining goods or services is expected to provide current or future benefits for the organization. Fees are referred to as cash equivalents as non-cash sources can be exchanged for desired goods or services. Understanding or meaning of costs has evolved under the development of technology and the business environment. The definition of cost conceptually, according to Carter et al. (2015), is the exchange rate, expense, sacrifice made to benefit. The operational cost of various types and their use following the intended purpose.

Cost of production

One of the important things that companies both manufacturing companies, service companies, and trading companies need to be considered is the cost of production. The cost of production is all costs – costs that should be incurred to produce goods or services expressed in the money unit. (Mulyadi, 2007) suggesting that the cost of production is the total of all costs used to process raw materials into products ready for sale. Determining the right production tree will benefit the company.

The cost of production is initiated by the amount of the cost of goods production at the beginning of the period. The amount is added with the cost of raw materials, direct labor costs, and all other costs used in production activities, including the factory supervision, indirect labor wage, factory auxiliary materials, patent amortization, lighting, heating, plant generation. All these costs are cost products that will remain attached to inventory value until the product is sold.

Activity-Based Costing method

The definition of Activity Based Costing (ABC) is a cost information system that provides complete information about activities to enable the company's personnel to manage activities (Mulyadi 2007). It suggests that Activity Based Costing is a cost calculation method whereby the shelter costs overhead of more than one is allocated on a baseline that includes one or more factors unrelated to the volume (Non-volume related factor). The Activity-Based Costing method reflects a more thorough search for costs.

The Activity-Based Costing method pays attention to the company's activities, with a search for costs to calculate the underlying price or service. Activity-Based Costing can reduce cost distortion and increase decision-making management effectiveness because using Activity Based Costing makes it easy to accurately calculate a cost object's staple price.

Benefits of Activity Based Costing

Activity-Based Costing can help management in making or buying raw materials and other materials. The decision to be taken by the management will be better and more precise. This ABC is based on a cost calculation that becomes more accurate. Besides, the Activity-Based Costing method can convince management that they should take steps to become more competitive. Management can strive to improve quality by focusing on possible cost reductions.

Weakness Activity Based Costing

The weaknesses found in the Activity-Based Costing method According to Carter et al. (2015), among others:

a) The use of the Activity-Based Costing method makes management make radical changes to their way of thinking about costs
b) The Activity-Based Costing method does not show the cost that will be avoided by stopping producing a product or producing it with fewer batches. Activity-Based Costing Method seeks to demonstrate the long-term consumption of resources from each product but does not predict how much expenditure will be affected by a particular decision.

c) It takes effort to collect data beyond what is required to meet external reporting requirements. In companies with a long history of success using traditional methods, it won't be easy to convince the management that a new cost calculation system is needed.

The implementation method of Activity Based Costing

An Activity-Based Method Costing, Direct raw material cost, and direct labor cost are the product's direct cost. The cost can be traced and identified accurately to the resulting product. Simultaneously, factory overhead costs are indirect costs because those costs cannot be charged directly to the resulting product. Here are the steps in the overhead load of each factory – each product with an Activity Based Costing method:

1) Identifying activity and activity triggers (drivers)
2) Search for direct activity and cost objects
3) Charge an activity
4) Calculating activity Rates
5) Charge activity to Products

RESEARCH METHODS

Data Collection Procedures

The required data types and sources influence data collection procedures. The data collection procedures used in this study are:

1. Preliminary Survey
   The first stage to collect data on this research is preliminary surveys. The author performs observations directly at PT Ionuda to determine the public company's condition and identify problems discussed in this research. The issues that will be addressed are implementing the Activity Based Costing method to calculate the base price and the impact of the method on THE profit of PT Ionuda by collecting related data.
2. Interview
   In non-mainstream research, interviews are essential data. According to Chamin (2009), information for research purposes is conducted through question and answer. The interviewer uses speakers, with or without interview guidelines, where the interviewer and the informant are involved in social life. Researchers can dig out information that cannot be obtained on documents from the resource. The material on the interview corresponds to research issues and research purposes.
3. Literature study
   A literature study is an activity to collect and study various literature on the basic concepts and theories related to the problems discussed in the research on calculating the cost of producing products using Activity Based Costing. The literature will be used as a foundation for the theory to solve problems with this research.
4. Documentation
   Documentation is a technique of collecting data and quoting data relating to this research's problem, namely the company's production data. The results of the following documentation will be studied and processed as material from the research.

Analytical techniques

The data analysis techniques needed for this study are as follows:

1) Perform documentation of the necessary data, such as production data, sales data, and tariffs on the calculation of the production base with the traditional method in 2017.
2) Implement the Activity Based Costing method to calculate the principal production price with the following steps:
   a) Identify and classify activities according to the company's activity groups.
   b) Arrange the cost classification according to the Activity.
   c) Determine the cost driver and cost pool.
   d) Calculate Pool rates and charge fees to products
   e) Calculate the cost of production with the Activity Based Costing method.
3) To analyze the results of the production price calculation with the Activity Based Costing method.

4) Evaluate the company's profit after implementing the Activity Based Costing method on the price calculation of production items.
5) Data analysis results can generate information for the company in determining the right method to calculate the cost of production.

RESULTS AND DISCUSSION

Results of analysis

The cost of material, on the price calculation of PT Ionuda product, is the raw material cost used in the production process. Costing an ingredient in the production process is done by estimating the amount of material to be used. When all costs have been known, the cost consumed in the production process of an order can be calculated by multiplying the price of the materials used with the number of materials used. Details of raw material cost for pipe mounting products, flange, separator, inner pipe, resonant cover in the year 2017 in the table as follows:

Table 2. Product raw Material Cost

Products	Raw materials	Specifications (mm)	Price per unit/(kg/m/PC)
Pipe Mounting	Plat SUS 432	1.2 x 750 x 1250	Rp 70.000, -
Flange	Plat SUS 425	2 x 104 x 1220	Rp 62.000, -
Separator	Plat SUS 509	1 x 110 x 440	Rp 68.000, -
Inner Pipe	Plat SUS 408	1 x 524 x 665	Rp 60.000, -
Resonan Cover	Plat SUS 409	1 x 1200 x 1410	Rp 59.000, -

Source: Company Data

The direct labor cost referred to is the labor cost involved directly in the production process. The cost of direct labor costs to each of these products is based on the amount of labor cost during the year 2017 divided by the number of products produced.

Table 3. Direct labor cost per the unit year 2017

Type Components	Number of units	Direct labor cost	Direct labor cost/Unit
Pipe Mounting	12.179	Rp 420.000.000, -	Rp 34.486, -
Flange	11.775	Rp 378.000.000, -	Rp 32.102, -
Separator	4.228	Rp 252.000.000, -	Rp 59.603, -
Inner Pipe	6.563	Rp 294.000.000, -	Rp 44.797, -
Resonan Cover	7.205	Rp 336.000.000, -	Rp 46.634, -
Amount	41.950	Rp 1.680.000.000, -	Rp 40.048, -

Source: Company Data

Overhead is a cost consumed in the production process and raw material costs, and direct labor costs. Details of the overhead amount during the production process of PT. Ionuda in the year 2017 is presented in table 4.

Table 4. Overhead costs in 2017

No.	Description	Total (Rp)
1.	Indirect labor costs	4.591.113.000
2.	Energy costs	378.858.764
3.	Machine Maintenance Cost	159.226.000
4.	Machine Depreciation Cost	89.072.000
5.	Cost of building depreciation	0
6.	Quality control fee	3.360.000
Total		5.221.570.000

Source: Company Data

The price of PT. Ionuda production is calculated based on raw material cost, direct labor cost, and factory overhead cost. Detailed product price of PT. Ionuda described in table The following table:

Table 5. The production cost of PT. Ionuda year 2017

Components	Total production	Cost of raw materials/Unit (Rp)	TKL Fee/Unit (Rp)	Overhead costs /unit (Rp)	Production principal price/Unit (Rp)
Pipe Mounting	12.179	70.000	34.486	124.471	228.957
Flange	11.775	62.000	32.102	124.471	218.573
Separator	4.228	68.000	59.603	124.471	252.074
Inner Pipe	6.563	60.000	44.797	124.471	229.268
Resonan Cover	7.205	59.000	46.634	124.471	230.105

Source: Company Data

Discussion

The calculation of the production base with Activity Based Costing method is done through various stages, among others:

1. It is identifying and classifications of Activity – activities that occur during the production process.
2. Arrange the classification of costs according to their activities.
3. Determine the right cost driver and cost pool for each Activity.
4. Calculate Pool rates and charge to products.

Calculation of the overhead per unit is presented in the table as follows:

Table 6. Overhead of Activity Based method Costing the **year 2017**

Products	Overhead costs (Rp)	Unit	Overhead per Unit fee (Rp)
Pipe Mounting	1.275.259.520	12.179	104.709
Flange	1.054.499.482	11.755	89.554
Separator	816.818.036	4.228	193.192
Inner Pipe	902.047.258	6.563	137.444
Resonan cover	1.173.005.467	7.205	162.804

Source: Processed Company Data

Calculation of production price using Activity-based costing Method at PT. Ionuda Sidoarjo, based on the overhead fee that has been accounted are presented in the table as follows:

Table 7. Cost of production with Activity Based Costing method (Rp)

Description	Pipe Mounting	Flange	Separator	Inner Pipe	Resonan Cover
Raw materials (per unit)	70.000	62.000	68.000	60.000	59.000
Direct labor (per unit)	34.486	32.102	59.603	44.797	46.634
Overhead (per unit)	104.709	89.554	193.192	137.444	162.804
Cost of production (per unit)	209.195	183.656	320.795	242.241	268.438
Production Unit	12.179	11.775	4.228	6.563	7.205
HPP year 2017	2.547.785.905	2.162.549.400	1.356.321.260	1.589.827.683	1.934.095.790

Source: Processed Company Data

Details of profit that will be obtained by the company when applying the Activity-based costing method to calculate the price of production of PT. Ionuda Sidoarjo on the Year 2018 presented in the table as follows:

Table 8. Cost and profit earned with Activity Based Costing

Products	Unit	Sales (RP)	Cost (RP)	Profit earned (RP)	% Profit
Pipe Mounting	12.179	3.288.330.000	2.547.785.905	740.544.095	23%
Flange	11.755	2.938.750.000	2.162.549.400	776.200.600	26%
Separator	4.228	1.374.100.000	1.356.321.260	17.778.740	1%
Inner Pipe	6.563	1.607.935.000	1.589.827.683	18.107.317	1%
Resonan Cover	7.205	1.945.350.000	1.934.095.790	11.254.210	1%
Total (Rp)	41.950	11.154.465.000	9.590.580.038	1.563.884.962	

Source: Processed Company Data

Details of the cost and profit obtained by PT. Ionuda in the year 2017 is presented in the table as follows:

Table 9. Cost and profit obtained by PT. Ionuda Year 2017

Products	Unit	Sales (RP)	Cost (RP)	Profit earned (RP)	% Profit
Pipe Mounting	12.179	3.288.330.000	2.856.206.901	432.123.099	13%
Flange	11.755	2.938.750.000	2.667.261.225	271.488.775	9%
Separator	4.228	1.374.100.000	983.090.332	391.009.668	28%
Inner Pipe	6.563	1.607.935.000	1.473.518.197	134.416.803	8%
Resonan Cover	7.205	1.945.350.000	1.610.454.395	334.895.605	17%
Total (Rp)	41.950	11.154.465.000	9.590.525.659	1.563.939.341	

Source: Processed Company Data

Table 10. Profit percentage comparison

Components	% Company profit	% Profit with ABC	Difference
Pipe Mounting	13%	23%	(10%)
Flange	9%	26%	(17%)
Separator	28%	1%	27%
Inner Pipe	8%	1%	7%
Resonan cover	17%	1%	16%

Source: Company Data processed

The table above shows the company's percentage of profits with the percentage of profit companies using the Activity Based Costing method in calculating the underlying price of the production. During this time, the company's highest profit percentage is found in the product separator. Still, it looks very different from the company's portion of profit with the Activity Based Costing method. This profit is due to the product's cost is quite large, so the company's profit very little.

The use of the Activity-Based Costing method in price calculation of production base has a significant impact. It can be found based on the fees for each product in the table above. In the product separator, inner pipe, and the resonant cover need a high cost on the production activities, so it impacts the number of small profits, which is 1%.

So far, the company considers that the products are making a big profit, but in reality, the company has to spend enormous costs to produce those products. Products that require a considerable cost during the production process should get the company's attention.

Companies can search for products that require the most considerable cost of cost and then evaluate production costs. Production base price calculated by activity-based costing method can help the company allocate the entire production cost according to each product's activity consumption.

The company's price calculation with Activity Based Costing does not affect the company's profit. Profits earned by the company are fixed. Only the profit allocation of each PR is a different product. In table 13, It can be known that the most significant profit products are pipe mounting and flange.

Table 11. Percentage of profit contributions

Components	Profit earned by ABC (RP)	%	PT. Ionuda year's profit 2017 (RP)	%
Pipe Mounting	740.544.095	47%	432.123.099	27%
Flange	776.200.600	49%	271.488.775	17%
Separator	17.778.740	1%	391.009.668	25%
Inner Pipe	18.107.317	1%	134.416.803	8%
Resonan Cover	11.254.210	0,7%	334.895.605	21%
Total (Rp)	1.563.884.962		1.563.939.341	

Source: Company Data processed

Based on the table above, it can know the products that significantly contribute to its profit. The product that has the most significant contribution to the company's profits using the Activity Based Costing method in calculating the introductory product price is Pipe Mounting of 47% and Flange of 49%.

The company is expected to make the right decision to increase profit acquisition after knowing each product's correct production cost. While this product with the highest percentage of profit is a Separator product, sales are lower than other products. Companies should be more focused on increasing sales in Pipe Mounting and Flange Products. This sale is because both products have the highest percentage of profit compared to other products.

CONCLUSION

Based on the results of the analysis and the test data outlined in the previous chapter, the conclusion can be taken as follows:

1. The price calculation of PT. Ionuda production is still using a simple method, which only charges the entire production cost for all products produced. The results in assessing the cost of not noticing the difference of resources consumed by each product make the production's loading cost less informative.
2. The Activity-Based Costing method provides the overhead cost component's consumption information overhead on each product in more detail through the activity pool. Overhead is charged based on the activity needs of each product.
3. The calculation of the production price with the Activity Based Costing method does not affect the company's total profit. Only the profit contribution of each product becomes different.
4. Percentage of the highest profit if the company uses Activity Based Costing method found in Flange product that is 26% and Pipe Mounting products by 23%.
5. The highest percentage of profit in 2017 is in the product Separator is 28% and Resonance cover of 17%.

Based on the conclusions described earlier, the suggestions that can be given in this study are:

1. The company can implement the Activity Based Costing method to produce the correct price calculation of the product. The Activity-Based Costing method can allocate overhead costs according to consumption
2. Based on the information, the company's management can use the Activity-based Costing method to make better decisions.

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Appendix

Activity	Indirect labor cost (RP)	Energy costs (RP)	Maintenance fee (Rp)	Machine Depreciation Cost (RP)	Building depreciation Cost (RP)	Quality Control fee (Rp)	Total (Rp)	Cost Driver	Price (Rp)
Facility level: Compile the schedule	46.500.000	-	-	-	-	-	46.500.000	41,950 Product Units	1109
Batch level: Set up and maintenance Machinery	93.000.000	42.257.664	159.226.000	-	-	-	294.483.664	2190 number set up	134.467
Unit level: Production process	4.312.113.000	336.541.336	-	89.072.000	-	-	4.737.726.336	229,364 kWh	20.656
Product Level: Quality Control	139.500.000	-	-	-	-	3.360.000	142.860.000	41,950 Product Units	3406

Source: Processed Company Data

Table 8. Overhead Cost allocation

Activity	Price (Rp)	Pipe Mounting (Rp)	Flange (Rp)	Separator (Rp)	Inner Pipe (Rp)	Resonan Cover (Rp)
Compile the schedule	1.109	12.179-unit x 1.109 = 13.506.511	11.775-unit x 1.109 = 13.058.475	4.228-unit x 1.109 = 4.688.852	6.563-unit x 1.109 = 7.278.367	7.205-unit x 1.109 = 7.990.345
Set up and maintenance Machinery	134.467	476 set up x 134.467 = 64.006.292	400 set up x 134.467 = 53.786.800	438 set up x 134.467 = 58.896.546	330 set up x 134.467 = 44.374.110	546 set up x 134.467 = 73.418.982
Production process Packing	20.656	55,977.2 KWH x 20,656 = 1,156,265,043	45,872.8 KWH x 20,656 = 947,548,556.8	35,768.4 KWH x 20,656 = 738,832,070.4	40,087.2 KWH x 20,656 = 828,041,203.2	51,658.4 KWH x 20,656 = 1,067,055,910
Quality Control	3406	12.179-unit x 3406 = 41.481.674	11.775-unit x 3406 = 40.105.650	4.228-unit x 3406 = 14.400.568	6.563-unit x 3406 = 22.353.578	7205-unit x 3406 = 24.540.230
Total (Rp)		1.275.259.520	1.054.499.482	816.818.036,4	902.047.258,2	1.173.005.467
Total Overhead costs		5.221.629.764				

Source: Company Data processed