CONVERSION COSTS AND PRODUCTION COSTS BASED ON TIME-DRIVEN ACTIVITY-BASED COSTING AT PT SC GRESIK

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A B S T R A C T
The business world today has developments that can be said to continue to change over time, as indicated by tighter competition. In 2019, the COVID-19 pandemic also impacted many companies due to a decline in sales. This condition demands that business owners continue thinking about strategies and appropriately make various company decisions. What can be done, especially in manufacturing companies, is to increase the quality of the product as best as possible and sell it at an affordable price. This research aimed to calculate the cost of production (especially in analyzing conversion costs) using the Time-Driven Activity-based Costing (TDABC) System method at PT SC Gresik, East Java, Indonesia. It compared gross profit results from the Functional Based Costing (FBC) and TDABC System methods. This type of research is a case study. The research results show that the TDABC method's calculations are more precise than the FBC method. HJ 5 tons, HJ 8 tons, HJ 10 tons, and HJ 20 tons of products produce lower production costs and higher gross profits. The 2-ton HJ product produces a higher production cost and a lower gross profit when compared to the FBC method calculation. The TDABC method allocates costs based on the activity's time.

INTRODUCTION

The business world today has developments that can be said to continue to change over time, as indicated by tighter competition between one company and another. This competitive condition provides challenges and demands for business owners to continue implementing strategies and making various decisions appropriately for their companies. The selling price of the product offered is an essential factor because the price of goods that are too high will make the company unable to compete with competing companies and also limit consumers' purchasing ability. On the other hand, if the selling price offered is too low, the company is likely to suffer losses, which will result in the product not being of good quality.

Companies need to know how much their products cost accurately. Costs that are managed appropriately by the company can impact the company's finances. This means that companies need to know precisely what drives the costs of the products they produce, not to obtain information on the cost of production that is too high or low. Profit can also be determined precisely from an accurate calculation of the cost of production, with minimal costs incurred. The method for determining product costs currently widely used by companies is the Functional Based Costing System (FBC) method. Alternatively, what is usually called Traditional Costing (Mulyadi, 2015:13) . According to, calculations based on the FBC method have limitations in that after being used for a while, there will be a situation where the tariff can be said not to

work as expected and can result in higher inefficiencies in the cost of production. According to the FBC method, one of the disadvantages is that it allocates direct and indirect costs only based on the number of goods produced (volume-based allocation), thus making the resulting cost information less accurate, especially when products are diverse.

This ABC method overcomes the shortcomings of the FBC method because calculations using the ABC method are carried out by understanding the costs related to activities and then the costs related to products. The emergence of this calculation method is due to the need for information that provides companies with an overview of the company's use of resources in various production processes. Over time, the Time-Driven Activity-based Costing System (TDABC) method emerged, which can overcome the difficulties of implementing the ABC method. This is because the TDABC method provides better benefits in calculating the cost price than the ABC method. The ABC method only focuses on classifying activity costs, whereas the same product of different types has different activities and times in the production process.

Method TDABC improves the ABC method by assigning resource costs directly to cost objects based on time. This method is also not as complex as other methods because it only requires two parameters: the unit cost of the activity and the time required to carry out the activity. The TDABC method considers the differences in time required by each product type. The current research focuses on previous research, such as Linggardjaja, Handoko, and Oki (2012), examining the comparison of the application of the TDABC method and traditional methods in calculating product costs and income from 2 and 3-star hotel customers. The object of this research is 88 Embong Hotels Malang Surabaya for the 2-star and 3-star hotels, namely the Grand Hotel Surabaya. The TDABC method was used in this research because it was considered suitable for application in the hotel industry. The results that can be concluded from this research are that applying the TDABC method is more accurate if used by 3-star hotels compared to 2-star hotels. This is because the products from 3-star hotels are more diverse, while 2-star hotels do not have as many product variations. Bayangkara (2019) researched how to calculate the cost of production for RIO brand drinking water when applying the TDABC method. This research focuses on drinking water packaging products with packaging sizes of 220 ML, 600 ML, 1500 ML, and gallon size packaging. Many of the primary consumers of this product come from East Java, state-owned companies and other companies. The results that can be concluded from this research are that the TDABC method, if applied to manufacturing companies, will provide the correct cost of production compared to traditional methods in calculating the cost of production.

Sulistyono, Sakinah, and Yuniaristanto (2021) examined how the cost of production is calculated when using TDABC for lemongrass and jasmine soap products. Their research focuses on herbal bath soap produced by CV. Supernova Marketindo Perkasa, taking into consideration the large number of users of this soap and the product, will be researched by estimating the time needed for the production process. The results of this research state that the TDABC method can reduce costs, increase net profit, and provide more accurate and efficient information. Based on previous research, it can be shown that the cost of production is determined more accurately using the TDABC method so that companies have a more precise basis for setting prices. This TDABC method will be applied to this case study research, namely at PT SC, to determine whether the FBC method applied has cost distortions. It is hoped that the resulting cost information can help determine product selling prices that are

better than the methods currently used by the company.

PT SC at Gresik, East Java, Indonesia, has been a manufacturing company in the spare parts development sector for 36 years. The HJ product is a tool used to lift loads using oil or what is usually called a jack. HJ is divided into five, grouped based on weight: HJ 2 tons, HJ 5 tons, HJ 8 tons, HJ 10 tons, and HJ 20 tons. PT SC still uses the FBC method to calculate production costs. Companies still pay less attention to time units when carrying out production processes. PT SC has many products with different consumption activities, so using the FBC method is inappropriate because overhead costs are still based on the number of goods produced by the company. Time units can play an essential role in calculating production costs, such as the time for processing one of the grouped products, the time required for machines to produce, and the time related to the working hours of the company's employees. The time consumption of each production process for each product is considered different, resulting in overcost or undercost calculations.

As a result of the COVID-19 pandemic, which has been going on since 2020 and the existence of competing companies that were only founded around 2019 in Indonesia, PT SC experienced a decline in sales of HJ spare parts. Customer companies choose to buy products from competing companies at prices that are thought to be cheaper. The FBC method will make it difficult for companies to survive in conditions like this because the FBC method used by the company provides a high COGS value and has a tendency not to consider time units in the production process. Although the TDABC method calculation is widely used in service companies, it is appropriate for PT SC because it has a variety of products, many production processes, and costs that are not directly related to production activities.

The problem formulation based on this background is: (1). How to calculate the cost of production using the Time-Driven Activity-based Costing System (TDABC) method at PT SC (2). What is the difference in gross profit for PT SC products using the Functional Based Costing System and Time Driven Activity-based Costing System (TDABC) methods?

RESEARCH METHOD

The type of research used is case study research. This research was conducted to get an in-depth picture of problems with competing companies' declining sales from PT SC in determining the selling price of HJ spare parts. The application of the Time-Driven Activity-based Costing System method is thought to be able to provide a more accurate calculation solution by showing a comparison of the calculation of the cost of production of spare parts using the Functional Based Costing System and Time Driven Activity-based Costing methods as well as showing the use of the Time-Driven Activity-based Costing method more appropriately used by companies in calculating the cost of production.

In this research, quantitative data will be used. This quantitative data is in the form of raw material, labour, and other costs. The primary data source for this research is data obtained directly from the company. Data collection tools and methods include:

a. Documentation

The documents required are related to the company's monthly reports, which consist of cost data for calculating HJ's cost of production, employee data in the company, production capacity data, production results data, and production activity time data related to company activities.

b. Interview

Interviews are carried out by asking the company's Finance Manager several questions. This is done to obtain

information related to the company's production activities, such as the number of raw material costs, labour costs and company production processes.

Data analysis in this research is as follows:

1. Identify activities and unit time for production activities.
2. Determine practical capacity or total effective working hours.
3. Determine the TDABC rate.
4. Allocate overhead costs.
5. Calculate raw material costs per unit.
6. Calculate labour costs per unit.
7. Calculate the cost of production per unit based on the TDABC method.
8. Compare the introductory price rates between the functional-based costing system method and the time-driven activity-based costing system method.

RESULT AND DISCUSSION

The research object is PT SC, which operates in the spare parts manufacturing sector. This company has been established since 1986. This company produces spare parts such as HJ, wiper blades, and fuel tank bands. Available labour hours are presented as follows.

Table 1. Availability of Labor Working Hours

Part	Number of employees	Working Hours Per Year (Minutes)	Non-Productive Working Hours (Minutes)	Total Effective Working Hours (Minutes)
Production Activities:				
-Sorting	2	241,920	53,760	188,160
-Cleaning	2	241,920	53,760	188,160
-Assembling	17	2,056,320	456,960	1,599,360
-Painting	1	120,960	26,880	94,080
-Inspection painting	1	120,960	26,880	94,080
-Finishing	2	241,920	53,760	188,160
Total Production Activity	**25**	**3,024,000**	**672,000**	**2,352,000**
Non-Production Activities:				
-Administration	3	241,920	53,760	188,160
-QC/QA	2	604,800	134,400	470,400
-Repair	5	362,880	80,640	282,240
Total Non-Production Activities	**10**	**1,209,600**	**268,800**	**940,800**
Total Employee Working Hours	**35**	**4,233,600**	**940,800**	**3,292,800**

Source: PT SC Processed

Total working hours per year PT SC is 4,233,600 minutes, and non-productive working hours are 940,800 minutes. The practical capacity of PT SC for 2021 is 3,292,800 minutes. In calculating the cost of production, PT SC uses the functional-based costing system or traditional method, which is the total production cost divided by the number of goods produced. Apart from information regarding the production volume of HJ products, there is information on raw material costs of IDR 14,305,649,914, direct labour costs of IDR 1,475,616,940, and total overhead costs of IDR 2,892,291,903. Data for each HJ product in 2021 is presented as follows.

Table 2. Total HJ Production Year 2021

No	Product name	Number of units)	Number of Tons of Raw Materials	Raw Material Costs
1	H.J. 2 Tons	27,992	27,992	IDR 2,483,117,396
2	H.J. 5 Tons	7,859	7,859	IDR 1,292,409,438
3	H.J. 8 Tons	39,893	39,893	IDR 8,711,604,163
4	H.J. 10 Tons	567	567	IDR 150,075,597
5	HJ 20 Tons	4,027	4,027	IDR 1,668,443,320
Total Production in 2021		**80,338**		

Source: PT SC Processed

Table 3. PT SC Production Costs in 2021

Production cost		
Raw Material		IDR 14,305,649,914
Direct labor		IDR 1,475,616,940
Overhead		
Indirect Labor:		
- Administration	IDR 200,379,329	
- QC/QA	IDR 133,586,219	
- Repair	IDR 333,965,548	
Total TKTL		IDR 667,931,095
Fixed Asset Depreciation		IDR 637,497,721
Other Overhead		IDR 1,586,863,087
Total Overhead Costs 2021		**IDR 2,892,291,903**
Total Production Costs 2021		**IDR 18,673,558,757**

Source: PT SC Processed

The cost of goods sold for each product is calculated using the Functional Based Costing System method, which divides the cost of goods sold by the amount of production resulting in COGS/unit. The calculation of the cost of production and gross profit is presented as follows.

Table 4. Production Cost of PT.SC

Production Cost of P.T. Sinarberlian Chemindo						
Part	**Product**					**Amount**
	2T	**5T**	**8T**	**10T**	**20T**	
Raw Material	IDR 2,483,117,396	IDR 1,292,409,438	IDR 8,711,604,163	IDR 150,075,597	IDR 1,668,443,320	IDR 14,305,649,914
Direct labor	IDR 256,131,676	IDR 133,311,053	IDR 898,595,363	IDR 15,480,184	IDR 172,098,663	IDR 1,475,616,940
Overhead	IDR 1,007,755,171	IDR 282,936,121	IDR 1,436,209,526	IDR 20,412,874	IDR 144,978,211	IDR 2,892,291,903
Total Producti	IDR 3,747,004,244	IDR 1,708,656,612	IDR 11,046,409,052	IDR 185,968,656	IDR 1,985,520,193	IDR 18,673,558,757

on						
Changes in the Value of Work in Process	IDR 12,078,840	IDR 3,855,659	-IDR 80,397,899	-IDR 1,450,814	-IDR 22,777,760	-IDR 88,691,974
Cost of goods sold	IDR 3,759,083,084	IDR 1,712,512,271	IDR 10,966,011,153	IDR 184,517,842	IDR 1,962,742,433	IDR 18,584,866,783
Changes in the Value of Finished Goods	-IDR 158,762,121	-IDR 11,922,450	-IDR 264,351,008	IDR 7,516,135	IDR 34,951,374	-IDR 392,568,070
Cost of goods sold	IDR 3,600,320,963	IDR 1,700,589,821	IDR 10,701,660,145	IDR 192,033,977	IDR 1,997,693,807	IDR 18,192,298,713
Sales (Units)	26,235	7,754	38,196	557	3,935	76,677
Sale	IDR 3,711,769,881	IDR 1,845,656,040	IDR 11,271,066,904	IDR 207,511,848	IDR 2,147,260,403	IDR 122,133,276,672
Cost of goods sold	IDR 3,600,320,963	IDR 1,700,589,821	IDR 10,701,660,145	IDR 192,033,977	IDR 1,997,693,807	IDR 18,192,298,713
Gross profit	**IDR 111,448,918**	**IDR 145,066,219**	**IDR 569,406,759**	**IDR 15,477,871**	**IDR 149,566,596**	IDR 990,966,363

Source: PT SC Processed

Data analysis

1. Identifying Activity and Activity Unit Time

Identifying these activities is done by determining activities related to producing a product. The results of identifying production activities at PT SC are presented as follows.

Table 5. PT Activity List. SC

Part	Activity	Number of employees	Effective Labor Hours (Minutes)
Production	Sorting	2	188,160
	Cleaning	2	188,160
	Assembling	17	1,599,360
	Painting	1	94,080
	Inspection painting	1	94,080
	Finishing	2	188,160
Administration	Make production plans.	1	62,720
	Create production reports.	1	62,720
	Record material usage.	1	62,720

QC/QA	Checking and conducting product testing.	2	470,400
Repair	Replacement of damaged products.	3	169,344
	Component repair.	2	112,896
Amount		**35**	**3,292,800**

Source: PT SC

Identifying activity unit time is done by estimating the time required based on production activity time data until it becomes finished goods. The data flow for calculating the cost of products using the TDABC method, production activity time data for each type of HJ product, and activity unit time for the product are presented as follows.

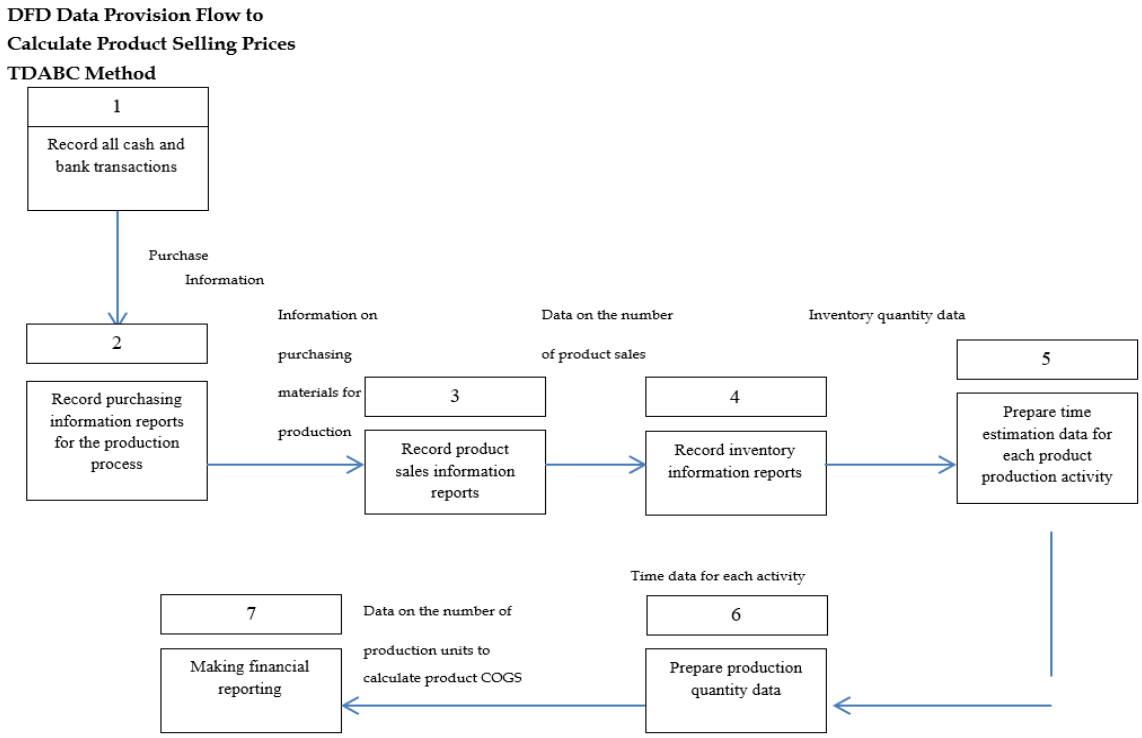

Figure 2. Data Provision Flow for Calculating Product Selling Prices TDABC Method

(Source: PT SC. 2022 Processed)

Table 6. Production Activity Time Data for Each Type of HJ Product

Activity	Conversion											
	2T		5T		8T		10T		20T		Total	
	Second	Minute	Second	Minute	Second	Minute	Second	Minute	Second	Minute	Second	Minute
Sorting	15	0.25	16	0.27	20	0.33	20	0.33	20	0.33	**91**	**1.52**
Cleaning	50	0.83	52	0.87	58	0.97	64	1.07	75	1.25	**299**	**4.98**
Assembling	281	4.68	283	4.72	373	6.22	367	6.12	385	6.42	**1,689**	**28.15**
Painting	57	0.95	62	1.03	74	1.23	84	1.40	101	1.68	**378**	**6.30**

Inspection painting	20	0.33	17	0.28	18	0.30	22	0.37	22	0.37	**99**	**1.65**
Finishing	20	0.33	21	0.35	23	0.38	25	0.42	27	0.45	**116**	**1.93**
Total	**443**	**7.38**	**451**	**7.52**	**566**	**9.43**	**582**	**9.70**	**630**	**10.50**	**2,672**	**44.53**

Source: PT SC Processed

Table 7. Activity Unit Time on Product

z	Activity	Time Conversion (Minutes)	Total production in 2021	Activity time (minutes)
2T	Sorting	0.25	27,992	6,998
	Cleaning	0.83	27,992	23,327
	Assembling	4.68	27,992	131,096
	Painting	0.95	27,992	26,592
	Quality inspection	0.33	27,992	9,331
	Finishing	0.33	27,992	9,144
Amount		**7.38**	**167,952**	**206,488**
5T	Sorting	0.27	7,859	2,096
	Cleaning	0.87	7,859	6,811
	Assembling	4.72	7,859	37,068
	Painting	1.03	7,859	8.121
	Quality inspection	0.28	7,859	2,227
	Finishing	0.35	7,859	2,751
Amount		**7.52**	**47,154**	**59,073**
8T	Sorting	0.33	39,893	13,298
	Cleaning	0.97	39,893	38,563
	Assembling	6.22	39,893	248,001
	Painting	1.23	39,893	49.201
	Quality inspection	0.30	39,893	11,968
	Finishing	0.38	39,893	15,292
Amount		**9.43**	**239,358**	**376,324**
10T	Sorting	0.33	567	189
	Cleaning	1.07	567	605
	Assembling	6.12	567	3,468

	Painting	1.40	567	794
	Quality inspection	0.37	567	208
	Finishing	0.42	567	236
Amount		**9.70**	**3,402**	**5,500**
20T	Sorting	0.33	4,027	1,342
	Cleaning	1.25	4,027	5,034
	Assembling	6.42	4,027	25,840
	Painting	1.68	4,027	6,779
	Quality inspection	0.37	4,027	1,477
	Finishing	0.45	4,027	1,812
Amount		**10.50**	**24,162**	**42,284**
Total production activity time in 2021				**689,669**

Source: PT SC Processed

Within the company, of course, some activities are not directly distributed to the product because they are outside the production process but are indirectly related to the product. The indirect activity unit time and indirect activity unit time distribution are presented as follows.

Table 8. Indirect Activity Unit Time

Activity	Activity time (Minutes)	Number of employees	Number of Activities (Year)	Activity time (Minutes /year)	Product (%)				
					2T	5T	8T	10T	20T
Administration									
Make production plans.	420	1	224	94,080	34.84	9.78	49.66	0.71	5.01
Create production reports.	420	1	224	94,080	34.84	9.78	49.66	0.71	5.01
Record material usage.	420	1	224	94,080	34.84	9.78	49.66	0.71	5.01
Amount	**1260**	**3**	**672**	**282,240**					
QC/QA									
Checking and conducting product	420	2	224	188,160	29.94	8.57	54.57	0.80	6.13

testing.									
Amount	**420**	**2**	**224**	**188,160**					
Repair									
Replacement of damaged products.	420	3	224	282,240	29.94	8.57	54.57	0.80	6.13
Component repair.	420	2	224	188,160	29.94	8.57	54.57	0.80	6.13
Amount	**840**	**5**	**448**	**470,400**					

Source: PT SC Processed

Table 9. Indirect Activity Unit Time Distribution

Sections / Activities	Total Activity time	Product				
		2T	5T	8T	10T	20T
Administration						
Make production plans.	94,080	32,780	9,203	46,717	664	4,716
Create production reports.	94,080	32,780	9,203	46,717	664	4,716
Record material usage.	94,080	32,780	9,203	46,717	664	4,716
Amount	**282,240**	**98,340**	**27,610**	**140,150**	**1,992**	**14,147**
QC/QA						
Checking and conducting product testing.	188,160	56,335	16,117	102,671	1,501	11,536
Amount	**188,160**	**56,335**	**16,117**	**102,671**	**1,501**	**11,536**
Repair						
Replacement of damaged products.	282,240	84,503	24,175	154,007	2,251	17,304
Component repair.	188,160	56,335	16,117	102,671	1,501	11,536
Amount	**470,400**	**140,838**	**40,292**	**256,678**	**3,751**	**28,840**
Total Productive Time in 2021	**940,800**	**229,954**	**65,612**	**406,066**	**5,916**	**45,092**

Source: PT SC Processed

2. Determine the TDABC rate.

Based on activity, unit time, overhead costs, and effective working hours, TDABC rates can be determined by dividing all production activity resource costs by the total practical capacity.

$$\text{Tarif TDABC} = \frac{\text{Jumlah Biaya Aktivitas Produksi}}{\text{Jumlah Kapasitas Praktis}}$$

$$\text{Biaya TKTL} = \frac{2.892.291.903}{940.800}$$

$$= 3{,}074 \text{ /minute}$$

$$\text{Biaya TKL} = \frac{1.475.616.940}{2.352.000}$$

$$= 627 \text{ /minute}$$

3. TDABC overhead cost allocation

Overhead costs for production activities for each product are assigned by multiplying the TDABC rate by the activity time.

Table 10. Imposition of Overhead Costs on Products

Activity	TDABC rates	Product 2T		Product 5T		Product 8T		Product 10T		Product 20T	
		Activity Time (Minutes)	BOP	Activity Time (Minutes)	BOP	Activity Time (Minutes)	BOP	Activity Time (Minutes)	BOP	Activity Time (Minutes)	BOP
Administration											
Make plans for products	3.074	32.780	IDR 100.775.517	9.203	IDR 28.293.612	46.717	IDR 143.620.953	664	IDR 2.041.287	4.716	IDR 14.497.821
Create production reports	3.074	32.780	IDR 100.775.517	9.203	IDR 28.293.612	46.717	IDR 143.620.953	664	IDR 2.042.287	4.716	IDR 14.497.821
Record material usage	3.074	32.780	IDR 100.775.517	9.203	IDR 28.293.612	46.717	IDR 143.620.953	664	IDR 2.041.287	4.716	IDR 14.497.821
Amount	9.223	98.340	IDR 302.326.551	27.610	IDR 84.880.836	140.150	IDR 430.862.858	1.992	IDR 6.123.862	14.147	IDR 43.493.463
QC/QA:											
Checking and conducting product testing	3.074	56.335	IDR 173.191.197	16.117	IDR 49.547.792	102.671	IDR 315.641.140	1.501	IDR 4.613.033	11.536	IDR 35.465.220
Amount	3.074	56.335	IDR 173.191.197	16.117	IDR 49.547.792	102.671	IDR 315.641.140	1.501	IDR 4.613.033	11.536	IDR 35.465.220
Repairs:											
Replacement of damaged products	3.074	84.503	IDR 259.786.795	24.175	IDR 74.321.688	154.007	IDR 471.461.709	2.251	IDR 6.919.549	17.304	IDR 53.197.829
Component repair	3.074	56.335	IDR 173.191.197	16.117	IDR 49.547.792	102.671	IDR 315.641.140	1.501	IDR 4.613.033	11.536	IDR 35.465.220
Amount	6.149	140.838	IDR 432.977.992	40.292	IDR 123.869.480	256.678	IDR 789.102.849	3.751	IDR 11.532.581	28.840	IDR 88.663.049
total			IDR 908.495.740		IDR 258.298.108		IDR 1.535.606.846		IDR 22.269.476		IDR 167.621.732
Total Overhead Hydraulic Jack Costs 2021											IDR 2.892.291.903

Source: processed by researchers

Based on the information obtained from the time details of production activity units, it can be seen that there is unused capacity. Production activity capacity is presented as follows.

Table 11. Production Activity Capacity

Part	Production Quantity (Units)	Effective Working Hours (Minutes)	Total Activity Time (Minutes)
Production Activities			
- Sorting	80,338	188,160	
Used Capacity			23,923
Unused Capacity			164,237
- Cleaning	80,338	188,160	
Used Capacity			74,340
Unused Capacity			113,820
- Assembling	80,338	1,599,360	
Used Capacity			445,474
Unused Capacity			1,153,886
- Painting	80,338	94,080	
Used Capacity			91,487

Unused Capacity			2,593
- Painting inspection	80,338	94,080	
Used Capacity			25,210
Unused Capacity			68,870
- Finishing	80,338	188,160	
Used Capacity			29,235
Unused Capacity			158,925
Total Used Capacity			**689,669**
Total Unused Capacity			**1,662,331**
Total Practical Capacity			**2,352,000**

Source: processed by researchers.

Based on the details of production activity capacity, unused capacity for production activities per product unit can be found. Unused capacity per product unit is obtained from the amount of production per product unit divided by the number of production units multiplied by unused capacity per activity. The unused capacity of production activities per unit of product is presented below.

Table 12 Unused Capacity Production Activities Per Product Unit

Activity	Product name					Total (Minutes)
	HJ 2 Ton (Minute)	HJ 5 Ton (Minute)	HJ 8 Ton (Minute)	HJ 10 Ton (Minute)	HJ 20 Ton (Minute)	
Sorting	57,225	16,066	81,554	1,159	8,233	164,237
Cleaning	39,658	11,134	56,519	803	5,705	113,820
Assembling	402,046	112,878	572,979	8,144	57,839	1,153,886
Painting	903	254	1,287	18	130	2,593
Inspection painting	23,996	6,737	34,199	486	3,452	68,870
Finishing	55,374	15,547	78,916	1,122	7,966	158,925
Total Production Time (Minute)	**579,203**	**162,616**	**825,455**	**11,732**	**83,326**	**1,662,331**

Source: processed by researchers.

1. Cost of goods manufactured, cost of goods sold and gross profit of TDABC. Next, the cost of production for each HJ product can be calculated. Following are the direct labour costs for each product in 2021 and the calculation of the cost of goods manufactured, cost of goods sold and gross profit for HJ products.

Table 1 3. Direct labor costs

Product name	Production Time (Minutes)	TKL Costs (Used Capacity)	TKL Fees (Unused Capacity)	Total TKL Cost	FBC TKL fees
H.J. 2 Tons	206,488	IDR 129,547,908	IDR 363,384,888	IDR 492,932,796	IDR 256,131,676
HJ 5 Tons	59,073	IDR 37,062,004	IDR 102,023,501	IDR 139,085,504	IDR 133,311,053
HJ 8 Tons	376,324	IDR 236,101,199	IDR 517,880,585	IDR 753,981,784	IDR 898,595,363
HJ 10 Tons	5,500	IDR 3,450,572	IDR 7,360,647	IDR 10,811,219	IDR 15,480,184
HJ 20 Tons	42,284	IDR 26,528,167	IDR 52,277,470	IDR 78,805,637	IDR 172,098,663
Amount	**689,669**	**IDR 432,689,850**	**IDR 1,042,927,090**	**IDR 1,475,616,940**	**IDR 1,475,616,940**

Source: processed by researchers

Table 1 4. Cost of Goods Production and Cost of Goods Sold TDABC

Part	Product					Amount
	2T	5T	8T	10T	20T	
Raw Material Costs	IDR 2,483,117,396	IDR 1,292,409,438	IDR 8,711,604,163	IDR 150,075,597	IDR 1,668,443,320	IDR 14,305,649,914
Direct labor costs	IDR 492,932,796	IDR 139,085,504	IDR 753,981,784	IDR 10,811,219	IDR 78,805,637	IDR 1,475,616,940
Overhead Costs	IDR 908,495,740	IDR 258,298,108	IDR 1,535,606,846	IDR 22,269,476	IDR 167,621,732	IDR 2,892,291,903
Total Production Costs	IDR 3,884,545,932	IDR 1,689,793,051	IDR 11,001,192,793	IDR 183,156,293	IDR 1,914,870,689	IDR 18,673,558,757
Changes in the Value of Work in Process	IDR 12,078,840	IDR 3,855,659	-IDR 80,397,899	-IDR 1,450,814	-IDR 22,777,760	-IDR 88,691,974

Cost of goods sold	IDR 3,896,624,772	IDR 1,693,648,710	IDR 10,920,794,894	IDR 181,705,479	IDR 1,892,092,928	IDR 18,584,866,783
Changes in the Value of Finished Goods	-IDR 158,762,121	-IDR 11,922,450	-IDR 264,351,008	IDR 7,516,135	IDR 34,951,374	-IDR 392,568,070
Cost of goods sold	IDR 3,737,862,652	IDR 1,681,726,259	IDR 10,656,443,886	IDR 189,221,614	IDR 1,927,044,302	IDR 18,192,298,713
Sales (Units)	26,235	7,754	38,196	557	3,935	76,677
Sale	IDR 3,711,769,881	IDR 1,845,656,040	IDR 11,271,066,904	IDR 207,511,848	IDR 2,147,260,403	IDR 19,183,265,076
Cost of goods sold	IDR 3,737,862,652	IDR 1,681,726,259	IDR 10,656,443,886	IDR 189,221,614	IDR 1,927,044,302	IDR 18,192,298,713
Gross profit	**-IDR 26,092,770**	**IDR 163,929,781**	**IDR 614,623,017**	**IDR 18,290,234**	**IDR 220,216,101**	**IDR 990,966,363**

Source: processed by researchers

5. Comparison of costs and profits of the FBC and TDABC methods

Calculations using the FBC method are carried out by assigning overhead costs to products, but this method does not calculate the activities used for the product. The TDABC method uses time as a cost driver. The difference in HPP for each product produced by the FBC and TDABC methods has, of course, a difference in the gross profit of the product. A comparison of the cost of production of HJ using the FBC and TDABC methods, a comparison of production costs using the FBC and TDABC methods, and a comparison of the gross profit of HJ products using the FBC and TDABC methods are presented as follows.

Table 1 5. Comparison of Costs of FBC and TDABC Methods

Production cost					
Product name	**Direct labor costs**				**Information**
	FBC	**BTKL / units**	**TDABC**	**BTKL / units**	
HJ 2 Tons	IDR 256,131,676	Rp. 9,150	IDR 492,932,796	Rp. 17,610	Overcosted
HJ 5 Tons	IDR 133,311,053	Rp. 16,963	IDR 139,085,504	Rp. 17,698	Overcosted

HJ 8 Tons	IDR 898,595,363	IDR 22,525	IDR 753,981,784	Rp. 18,900	Undercosted
HJ 10 Tons	IDR 15,480,184	IDR 27,302	IDR 10,811,219	IDR 19,067	Undercosted
HJ 20 Tons	IDR 172,098,663	IDR 42,736	IDR 78,805,637	Rp. 19,569	Undercosted
Product name	**Overhead Costs**				**Information**
	FBC	**BOP/unit**	**TDABC**	**BOP/unit**	
HJ 2 Tons	IDR 1,007,755,171	IDR 36,002	IDR 908,495,740	IDR 32,456	Undercosted
HJ 5 Tons	IDR 282,936,121	IDR 36,002	IDR 258,298,108	IDR 32,867	Undercosted
HJ 8 Tons	IDR 1,436,209,526	IDR 36,002	IDR 1,535,606,846	IDR 38,493	Overcosted
HJ 10 Tons	IDR 20,412,874	IDR 36,002	IDR 22,269,476	IDR 39,276	Overcosted
HJ 20 Tons	IDR 144,978,211	IDR 36,002	IDR 167,621,732	IDR 41,624	Overcosted
Product name	**Production cost**				**Information**
	FBC	**Production Costs/unit**	**TDABC**	**Production Costs/unit**	
HJ 2 Tons	IDR 3,747,004,244	IDR 133,860	IDR 3,884,545,932	IDR 138,773	Overcosted
HJ 5 Tons	IDR 1,708,656,612	IDR 217,414	IDR 1,689,793,051	IDR 215,014	Undercosted
HJ 8 Tons	IDR 11,046,409,052	IDR 276,901	IDR 11,001,192,793	IDR 275,767	Undercosted
HJ 10 Tons	IDR 185,968,656	IDR 327,987	IDR 183,156,293	IDR 323,027	Undercosted
HJ 20 Tons	IDR 1,985,520,193	IDR 493,052	IDR 1,914,870,689	IDR 475,508	Undercosted

Source: processed by researchers.

Table 1 6. Comparison of Gross Profit of FBC and TDABC Methods

Product name	Gross profit				Information
	FBC	Gross Profit/unit	TDABC	Gross Profit/unit	
HJ 2 Tons	IDR 111,448,918	IDR 3,981	IDR (26,092,770)	IDR (932)	Undercosted
HJ 5 Tons	IDR 145,066,219	IDR 18,459	IDR 163,929,781	IDR 20,859	Overcosted
HJ 8 Tons	IDR 569,406,759	IDR 14,273	IDR 614,623,017	IDR 15,407	Overcosted
HJ 10 Tons	IDR 15,477,871	IDR 27,298	IDR 18,290,234	IDR 32,258	Overcosted
HJ 20 Tons	IDR 149,566,596	IDR 37,141	IDR 220,216,101	IDR 54,685	Overcosted
Amount	**IDR 990,966,363**		**IDR 990,966,363**		

Source: processed by researchers.

Discussion

The application of the TDABC method uses time as the driving force of its activities more accurately than the FBC method. It can be said to be more accurate because overhead costs are allocated according to the activities used for each product based on time as the driver compared to the FBC method. Overhead costs are high if production activities are low because they have fixed costs such as warehouse rental, depreciation, insurance, etc. Based on the details of production activity capacity, it can be seen that there will be quite a lot of unused activities in 2021, amounting to 1,662,331 minutes, and the used capacity will be only 689,669 minutes. Based on the calculation of direct labour costs, it can be seen that the company paid a reasonably large amount, namely IDR 1,475,616,940, while for unproductive work, it was IDR 1,042,927,090. This shows that if the company can only incur productive direct labour costs of IDR 432,689,850, this can help reduce production costs so that the selling price of each type of product can be more competitive.

Based on the comparison results of the FBC and TDABC method calculations. Regarding direct labour costs, HJ 2-ton and HJ 5-ton products are costed, while HJ 8-ton, HJ 10-ton and HJ 20-ton are undercoated due to the FBC method's inaccuracy of assignments based on raw material costs. The overhead costs for HJ 2 ton and HJ 5 ton products were undercosted, while HJ 8 ton, HJ 10 ton, and HJ 20 ton were overcosted due to the inaccuracy of charges based on the number of product production using the FBC method. The production costs for 2-ton HJ products are overcosted, while 5-ton HJ, 8-ton HJ, 10-ton HJ and 20-ton HJ are undercosted.

Regarding gross profit, the 2-ton HJ product produces a lower gross profit, while the 5-ton HJ, 8-ton HJ, 10-ton HJ and 20-ton HJ produce a higher gross profit. This shows differences in HJ 2 tons, HJ 5 tons, and HJ 8 tons because the inaccuracy of the selling price causes the gross profit of HJ 2 to be lower than HJ 5 tons and HJ 8 tons. The only activities that can be observed are activities at the unit level in the sense of activities carried out in production, so it cannot be known which products consume less batch level costs or which product level costs more. Calculating the new cost of production based on the TDABC method can produce a more competitive cost of production than the FBC method. This is because the time used to produce each product is different, so the costs charged to the product are also

different. Using the TDABC method, you can allocate the costs each HJ product uses.

CONCLUSIONS

Based on the results of the research that has been carried out, it can be concluded that PT SC has various types of products and has various activities within the company. This research focuses on HJ products because the main products in the company provide the largest sales and have the same production activities but require different times. The time difference is visible in production activities in the cleaning, assembling and painting sections. Production costs allocated to products are also different for each product. Calculating the cost of goods using the TDABC method can provide more accurate results because the charges are based on the time of production activity; it can increase company sales and profits.

Some limitations may affect the research, namely the unavailability of data from the company regarding detailed estimates of the time needed for non-production activities. This means only the production activity capacity can be known in this research. The allocation of overhead costs is less accurate because the timing of non-production activities is unknown, so it can only be estimated through a percentage of the production amount and production time. For further research, it is recommended to ask for more detailed data from companies that support production and non-production activities to allocate costs more accurately and find out used and unused capacity to reduce production costs.

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