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PRODUCTION COST ANALYSIS AT PTPN VII GUNUNG DEMPO PACKAGING STATION USING ACTIVITY-BASED COSTING METHOD

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Abstract
Production costs consist of components that are directly attached to the product, including direct and indirect costs. In determining production costs such as packaging costs, the usage of the traditional model is not always suitable shown by the possibility of overstated or understated conditions. This study aims to propose the implementation of the Activity-based Costing (ABC) system in calculating the cost of tea packaging and finding the differences compared to the traditional costing. The data used were based on the case of PTPN VII Gunung Dempo, South Sumatra, Indonesia. The results using the ABC system show that the total cost per unit for "BOPF" tea products is IDR 34,444.45, for "DUST" products is IDR 35,629.77, and for "DUST II" products is IDR 35,629.77. While the traditional system calculation shows that the total cost per unit for "BOPF" tea products is IDR 61,982.60, for "DUST" tea products is IDR 61,982.60, and for "DUST II" tea products is IDR 61,982.60. The strategy that can be applied to avoid possible losses in determining packaging costs due to incorrect cost calculations using the traditional system model is to implement Activity-based Costing.

Keywords:
Tea Product; production cost; packaging cost; activity-based costing; traditional system

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1. Introduction

Production cost will determine the product cost provided to customers. It is acknowledged that product cost is the fundamental key to profitability for companies [1]. Production costs are described as costs that are directly attached to the product, including direct and indirect costs such as factory overhead costs that can be identified by processing raw materials into finished products [2]. Direct materials are raw materials that are physically being part of the product and can be directly traced to the products that manufactured. Direct labor is referred to labor that is specifically involved in the production of a particular product and contributes directly to the completion of that product. Manufacturing overhead costs cover all other important production costs excluding direct material and direct labor costs. This manufacturing of factory overhead cost contains all indirect costs in the manufacturing process, such as indirect raw material costs, indirect labor costs, and joint costs that are used concurrently in the company production process. Unlike the direct costs group, these manufacturing costs cannot be easily identified in the product. Among all production cost components, we recognize the packaging cost too. Packaging costs include cost aspects such as time, labor, packaging material, and packaging transportation of the final product [3] in which the cost structure and the cost level are highly influenced by product characteristics [4].

The observed company in this study is PTPN VII Gunung Dempo which is located in South Sumatra, Indonesia. This company engages in vertical integration of tea plantations in the upstream up to its packaging in the downstream supply chain. This tea product produced is intended to meet local and export needs [5]. PTPN VII Gunung Dempo divides activities in the Packaging Department into two, namely numbering or labeling and tea filling. To this far, PTPN VII Gunung Dempo, which manages tea commodities, still uses the traditional model in determining packaging costs for the items they fabricated. The traditional model focuses on managing costs alone that were not defined according to the production activity information. Simply put the traditional costing system is calculated according to volume- or throughput-based product [6]. Further, traditional costing

systems falsify product costs due to the use of a single, only volume-based cost driver. Hence in determining any type of production costs such as packaging costs as in this study, it is not always suitable moreover profitable to use the traditional model because they may be distorted as overstated or understated which means that they did not represent the real costs correctly. Overstated conditions happened when there are more costs realized than their actual cost while in reverse, understated described conditions where a stated cost is known as less than the actual cost. Both of these conditions are considered errors or failures in cost calculations [7]. That overstated makes it difficult for products to compete in the market while understated causes financial losses to the company.

To continue to compete with other tea commodity companies, PTPN VII Gunung Dempo must have an improved strategy, one of which is to provide cost-effective products because the inaccuracy of spending costs will certainly result in unwanted losses. To address this, one way the company may achieve cost efficiency is by implementing the Activity-based Costing (ABC) system. The ABC method can provide the company's best estimate of production costs, in any scope and level, and also remove the generalization caused by the traditional costing system [8]. Among accounting methods, ABC is known to be established and even can easily be extended to industrial settings under 4.0 environment for example to realize such activity regarding carbon tax tracing in the product, as studied in [9], or to a management profitability analysis by adjusting the price, packaging, as well as order placement procedures according to every class type of customers [10]. The ABC method will ultimately generate costs that allow the identification of changes in policies, systems, or management processes that give rise to production activities.

However, research on the ABC method still takes place mostly in the automotive, electronics, or other widely known manufacturers. Even it was stated that the ABC is one of the procedures verified to be very appropriate to be applied in the financial management activities of warehouses in the automotive industry [11] and moreover in the remanufacturing companies where spare parts from customers are collected for reuse [12]. A bibliometric review regarding the ABC system and innovation management model was conducted by [13] which returned a total of 1,419 articles spanning from the year 1990 to 2020. They discussed the new important area for creating and benefiting from technology imposing an adequate costing system that highlights the costs incurred for producing a product or provision of service allowing the construction of more realistic and competitive prices in the market specified by the ABC system.

This study aims to elaborate on the calculation of the cost of the traditional model in determining the cost of packaging along with the application of the activity-based costing system in determining the cost of the dried tea-packed product. Later the differences that were obtained in the calculation between the cost of packaging based on the traditional model and the ABC system will be analyzed.

2. Research Methodology

Activity-based costing is a method that can be used to calculate costs in more detail compared to the traditional one. Compared to product costing, an activity-based costing (ABC) system offers greater precision [14] but obliges more resources to generate the required information [15]. The activity-based costing method allocates all costs from various resources used to carry out production activities or run a service business [16]. Activity-based costing (ABC) is an approach to allocating overhead costs to multiple activity cost pools and then assigning activity cost pools to products and services via cost drivers. Where in this study we will apply the ABC method in determining cost based on activity. Activity can be explained as any event, action, transaction, or work sequence that incurs costs when producing products or providing services to the customer. Activity cost pools are overhead costs associated with different activities, for example, ordering materials or setting up machinery. To be able to utilize the ABC method, these two hypotheses should be fulfilled: resources used when there is activity, and considered activity is product-oriented [17].

In applying the ABC method, first, we need to allocate overhead costs to activity cost pools in which under the traditional costing system, these costs are allocated to departments or jobs. The ABC framework is illustrated in Fig. 1. Examples of aggregated overhead costs are ordering materials, setting up machines, assembling products, and inspecting products. In the second stage, ABC assigns the overhead costs allocated to the activity cost pool to products, using cost drivers. A cost driver is defined as a characteristic of an event or activity that results in the incurrence of costs [6]. Cost drivers measure the number of individual activities that are performed to produce a product or provide a service. Therefore, we need to determine the cost driver. Cost drivers are the basis of allocation used in the activity-based costing method which are the factors that determine how much effort and workload is required to perform an activity. Cost drivers are used to calculate the sourcing cost of each unit of activity. Then each resource cost is assigned to the product or service by transferring the cost of each activity to the quantity of each activity consumed in a certain period [19]. In selecting the most representative, we need to consider these 3 things [6]:

- Degree of correlation between consumption of the activity and consumption of the cost driver

- Cost of measurement. Designing any information system implicates cost-benefit trade-offs, here between the number of activity cost pools considered in an activity-based costing system, and the degree of accuracy of the cost assignments that are taken.
- Behavioral effects. Information systems may not only assist stakeholders in making decisions but also influence their behavior which can be good or bad therefore in identifying cost drivers, an ABC analyst should consider the possible behavioral consequences.

In this study, we analyze the production costs of three main dried packed-tea products, namely the "BOPF", the "DUST", and the "DUST II" specifically at the packaging station at PTPN VII Gunung Dempo, South Sumatra, Indonesia. At the packaging station, there are 2 main activities, they are numbering the tea pack, and filling the tea into the pack or paper bag. With this method, the cost of production at the packaging station will be calculated and then it will be compared with the total cost using the traditional method.

3. Packaging Cost Calculation

A. Production System

The process of quality control in tea production is conducted at PTPN VII Gunung Dempo at their tea factory in South Pagaralam District, Pagaralam City, South Sumatra Province. The production process consists of picking, receiving, processing, withering, grinding, rolling and sorting, drying, and packaging tea leaves. Quality control which is very important in black tea processing is applied in the drying process. The drying process must have a fixed and controlled temperature because it will affect the quality of the tea product.

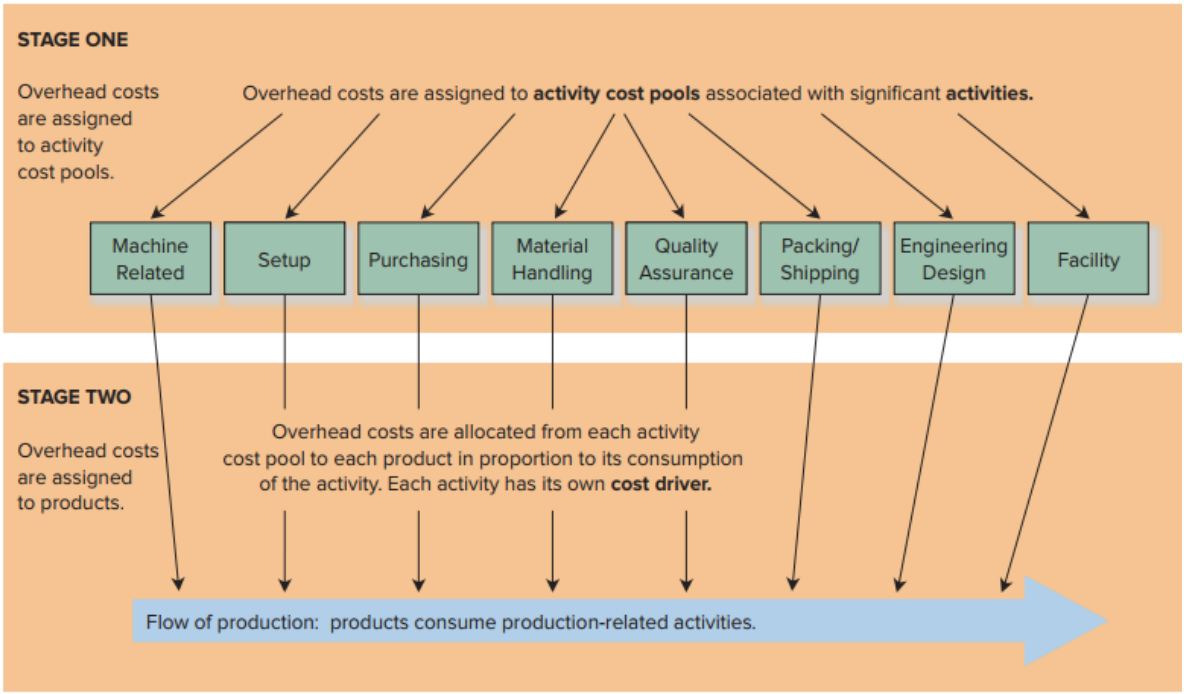

Figure 1. Activity-based costing system [5]

The tea leaf production process has several stages before reaches the delivery process to consumers, and another separate process after packaging is complete. Starting from receiving raw materials, loading, unloading, and bookkeeping processes of tea leaves, down to the end of the process, namely packaging to wrap the finished dried tea products so that it is easy to be arranged in the warehouse and the shipments. Finally, it will undergo quality control before past to the delivery process (see Fig. 2).

B. Packing Station

The boxes filled with the three main types of products, the "BOPF", "DUST", and "DUST II", will be brought to the tester laboratory room. It is then weighed and passed through a rolling press at the packing station [18]. The rolling press is used to flatten and compact the filling of the tea powder in the paper bag. The tea, which has been packaged in either paper sacks or sacks, is temporarily stored in the production warehouse

waiting for a recommendation from the laboratory. Because the condition of tea is hygroscopic to moisture/air and odors, the condition of the tea room should not be damp and must be kept from objects that smell heavily.

C. Elaboration of Process to Activities

This study focuses on the tea packaging section of PTPN VII, Gunung Dempo, Indonesia. In the packaging section, there are 2 main activities carried out. The two activities were described in Table 1. The table shows that at PTPN VII Gunung Dempo, we have activities of numbering and filling the tea pack. These activities generate costs which will be analyzed using the ABC method.

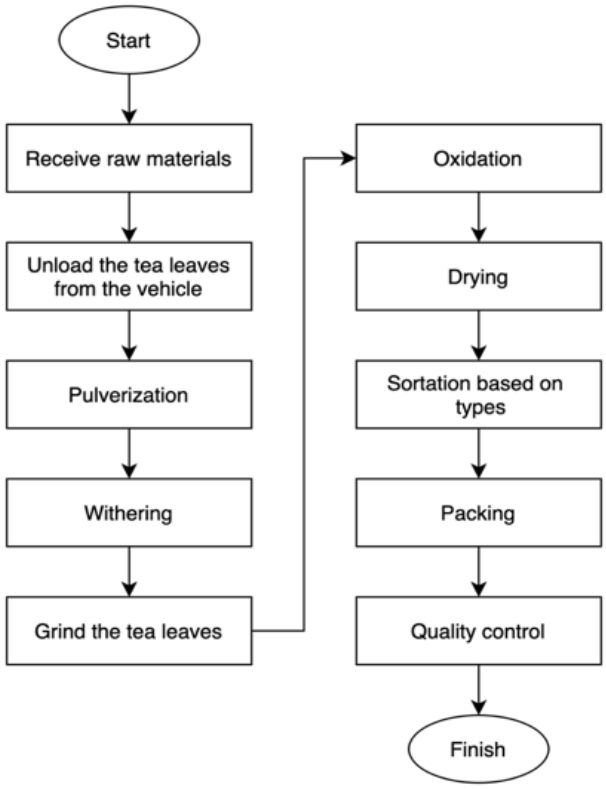

Figure 2. The tea production sequence at PTPN VII Gunung Dempo

Table 1. Activity description

Activity	Description
Numbering	Marking production number on the tea pack
	Tea type labeling on the pack
	Expiry and production dates labeling
Tea filling	Filling the "BOPF" tea
	Filling the "DUST" tea
	Filling the "DUST II" tea

D. Identify the Resources Used

The next stage is to determine the resources used in each activity. Assets like property, plant, and equipment have relatively lengthy valuable lives that are nowadays used in operating the business [20]. An explanation of the resources contained in each activity can be seen in Table 2. In the numbering activity, the resources used are employees of the packaging department, screen-printing ink, and depreciation of screen-printing equipment. Depreciation is explained as the provision of the cost of an asset over several years by thoroughly assigning a portion of an asset's cost as an expense each year. While in the activity of filling tea, the resources used are employees of the packaging department, tea packaging, and depreciation of the filling machine used to package tea [20].

Table 2. Resource identification

Activity	Description	Resource
Numbering	Marking production number on the tea pack	Packing station staff
		Depreciation of screen-printing equipment
		Screen-printing ink
	Tea type labeling on the pack	Packing station staff
		Depreciation of screen-printing equipment
		Screen-printing ink
	Expiry and production dates labeling	Packing station staff
		Depreciation of screen-printing equipment
		Screen-printing ink
Tea filling	Filling the "BOPF" tea	Packing station staff
		Tea pack
		Filling machine depreciation
	Filling the "DUST" tea	Packing station staff
		Tea pack
		Filling machine depreciation
	Filling the "DUST II" tea	Packing station staff
		Tea pack
		Filling machine depreciation

E. Bill of Material

The following Fig. 3 shows a typical bill of material chart for each tea product produced by PTPN VII Gunung Dempo. A tea pack consists of a tea product that has been filled and a pack where the product fill comes from a tea leaf while a tea pack can be divided into packing bags and stamp ink.

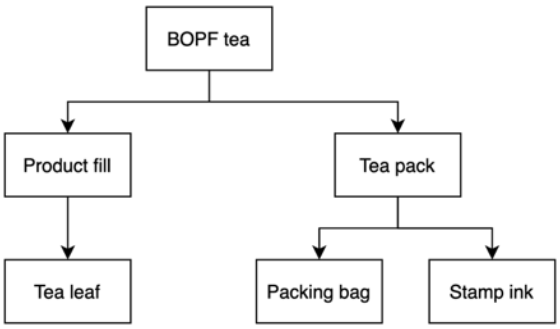

Figure 3. Bill of material for "BOPF" tea

F. Activity Cost Determination

In this packaging section, there are two costs, namely direct and indirect costs. These costs are described in Table 3 and Table 4. In the table, it can be seen that the direct costs required by the packaging department at PTPN VII Gunung Dempo, namely "BOPF", "DUST", and "DUST II" packaging are IDR 27,000/packaging unit and also the salaries of workers in the packaging department are known to be IDR 3,100,000 per worker/month. In addition, there is also a fee for numbering ink of IDR25,000/month.

Table 3. Direct cost

Item	Cost (in IDR)
"BOPF" pack	27,000
"DUST" pack	27,000
"DUST II" pack	27,000
Packing staff wage	3,100,000
Marking ink	25,000

Table 4. Overhead cost

Activity	Item	Cost (in IDR)
Numbering	Stamping equipment depreciation	12,500
	Electricity	1,500,000
Tea filling	Machine depreciation	416,666.67
	Electricity	1,500,000

Further from Table 4, we can see the overhead costs, costs that are outside of direct costs. In the packaging department, the overhead costs for numbering activities are the depreciation of the stamp tool, this stamping tool has an economic life of two years and when buying this stamping tool, the price is IDR100,000 so the depreciation is IDR12,500 per month and for electricity costs per month is known to be IDR1,500,000 for tea filling activity. This stamping tool has an economic life of 10 years and when buying this tea-filling machine, the price is IDR500,000,000 hence the depreciation is IDR416,666.67 per month.

G. ABC Systems

In performing calculations using ABC systems, several steps must be taken. These step details are described in the following Table 5. The first stage is to determine the estimated overhead contained in each activity. The estimated overhead cost is derived from the total of all overhead costs in each activity. In the table, it can be seen that the estimated overhead for numbering activities is IDR 1,512,500 while for tea-filling activities is IDR 1,916,667. In addition, the determination of cost drivers is carried out. In this packaging department, the cost driver is working hours. The next step is to calculate the activity-based overhead rate, this value is obtained by dividing the estimated overhead per activity by the expected use of cost drivers per activity as in Table 6, Table 7, and Table 8 for every type of tea.

Table 5. ABC costing

Activity Cost Pool	Estimated Overhead (in IDR)	Cost Driver	Expected Use per Product			Expected Use of Cost Driver per Activity	Activity-based Overhead Rates
			"BOPF"	"DUST"	"DUST II"		
Numbering	1,512,500	Working hours	13.9	8.1	5.1	27.1	55,743.24
Tea filling	1,916,667	Working hours	41.8	40.3	25.7	107.8	17,779.84

Table 6. Overhead per unit for "BOPF"

Activity Cost Pool	Expected Use per Product	Activity-based Overhead Rates	Cost Assigned
Packing	13.9	55,743.24	776,689.19
Quality control	41.8	17,779.84	743,197.28
Total cost assigned	1,519,886.47		
Unit produced	418		
Overhead cost per unit	3,636.09		

Table 7. Overhead per unit for "DUST"

Activity Cost Pool	Expected Use per Product	Activity-based Overhead Rates	Cost Assigned
Packing	8.07	55,743.24	449,662.16
Quality control	40.33	17,779.84	717,120.18
Total cost assigned	1,166,782.34		
Unit produced	242		
Overhead cost per unit	4,821.41		

Table 8. Overhead per unit for "DUST II"

Activity Cost Pool	Expected Use per Product	Activity-based Overhead Rates	Cost assigned
Packing	5.13	55,743.24	286,148.65
Quality control	25.67	17,779.84	456,349.21

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Total cost assigned	742,497.85
Unit produced	154
Overhead cost per unit	4,821.41

The next step is to determine the expected use of cost drivers for each product. After determining the expected use value per product, the next step is to determine the cost assigned to each product. This cost-assigned value comes from the value of expected use per product multiplied by activity-based overhead rates. The value of the total cost assigned is derived from the amount of cost assigned which has been determined previously. Next, the overhead per unit will be calculated by dividing the total assigned cost by the units to be produced. For every tea brand, the calculation is shown in Table 9, Table 10, and Table 11.

After determining all the cost components needed in calculation using the ABC method, the next step is to compare the total cost per unit produced with traditional costing for each type (brand) of tea. The comparison results are used to determine whether the company has applied the appropriate price for each product.

Table 9. Total cost per unit "BOPF" product

Manufacturing Cost	Traditional Costing (in IDR)	Activity-based Costing (in IDR)
Direct materials	52,000	52,000
Direct labor	3,808.35	3,808.35
Overhead	31,174.24	3,636.09
Total cost per unit	86,982.60	59,444.45

Table 10. Total cost per unit "DUST" product

Traditional Costing (in IDR)	Activity-based Costing (in IDR)
52,000	52,000
3,808.35	3,808.35
31,174.24	4,821.41
86,982.60	60,629.77

Table 11. Total cost per unit "DUST II" product

Manufacturing Cost	Traditional Costing (in IDR)	Activity-based Costing (in IDR)
Direct materials	52,000	52,000
Direct labor	3,808.35	3,808.35
Overhead	31,174.24	4,821.41
Total cost per unit	86,982.60	60,629.77

4. Result Analysis

From the calculation using the ABC method, it was found that the total cost per unit for "BOPF" tea products is IDR 59,444.45, for "DUST" products is IDR 60,629.77, and for "DUST II" products is IDR 60,629.77. While the calculation using the traditional system found that the total cost per unit for "BOPF" products is IDR 86,982.60, for "DUST" products is IDR 86,982.60, and for "DUST II" products is IDR 86,982.60. If the calculation with the traditional system is compared with the calculation using the ABC system, it is found that the calculation with the traditional system for the three products is overstated for the packaging activities by 32%, 30%, and 30% for these "BOPF", "DUST", and "DUST II" respectively.

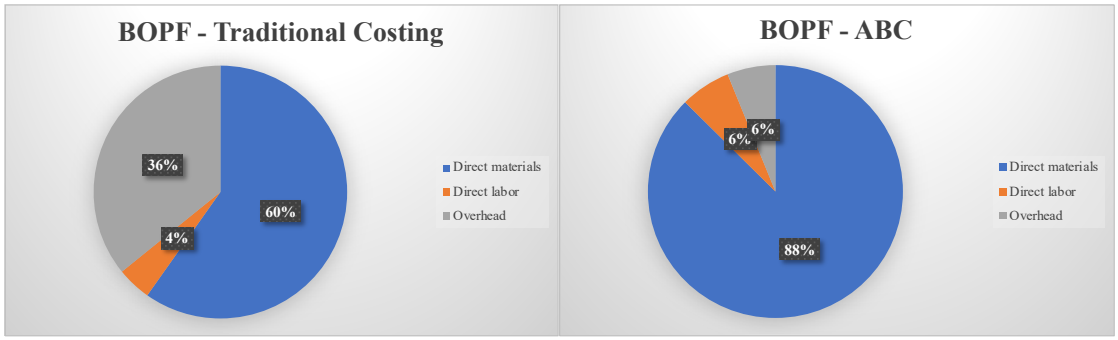

Figure 4. "BOPF" product cost pools percentages: traditional vs activity-based costing

The main difference in cost calculation using the traditional and the ABC systems is in the overhead cost details. While for two other cost components: the direct materials and direct labor costs are the same for both models, the proportion for each product can be seen in Figs. 4, 5, and 6. The difficulty in calculating production cost lies in the identification of overhead cost because we need to realize mostly indirect costs that should be considered in the final product cost and price. The occurrence of overstated costs mainly caused by miscalculation of overhead costs may cause the product's price to exceed what it should be.

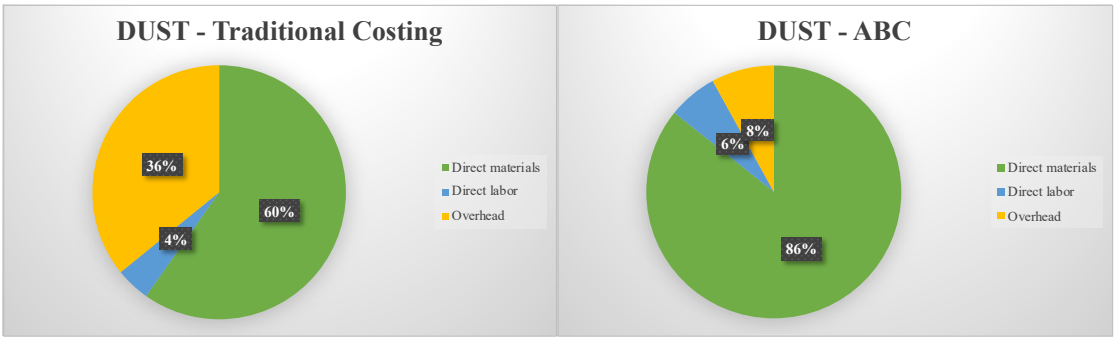

Figure 5. "DUST" product cost pools percentages: traditional vs activity-based costing

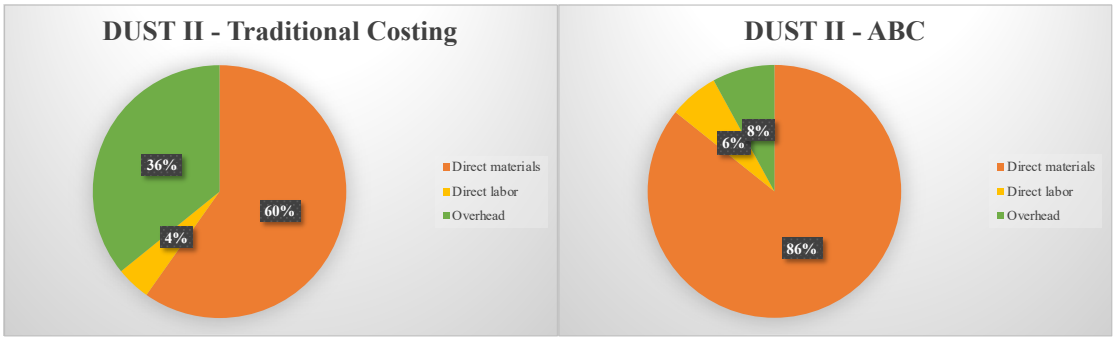

Figure 6. "DUST II" product cost pools percentages: traditional vs activity-based costing

5. Conclusion

In determining the packaging costs for the three main products of PTPN VII Gunung Dempo, logistics costs were calculated using the traditional and activity-based costing (ABC) system. Based on the analysis of the result, the cost comparison between the traditional model and the ABC system is known that there is an overstated state for the three products. The occurrence of the overstated cost may cause the prices of the products set to be higher than the market price so that with a high selling price, the company may suffer losses and struggle to compete in the future. The strategy that PTPN VII Gunung Dempo can do to avoid this possibility is to apply an activity-based costing method in calculating the packaging costs of all products since it provides the most effective cost estimate for each product based on the activity details therefore no aspect that should be considered in the cost calculation is missing. This far, almost all production cost studies have focused on general manufacturing environments, there has been no calculation using the ABC method specifically for the packaging area, let alone dried tea leaf products. The ABC model gives another advantage in that it captures a clear picture of the use of resources owned by the company. That in the future, the company's level of demand will increase due to competitive product prices.

References

[1] C. Guang, "Application Research on the Activity-Based Costing of Value Chain Accounting," in *2009 Second International Conference on Future Information Technology and Management Engineering*, Northwest (Washington, D.C.), 2009.

[2] Harnanto, Akuntansi Biaya: Sistem Biaya Historis (Cost Accounting: Historical Cost Systems), Yogyakarta: Penerbit Andi, 2017.

[3] A. N. Praswati, N. Amriyatul K, D. Atsiska and A. Latifah, "Harga Pokok Produksi Pada Inovasi Desain Kemasan Produk Kuliner (Studi Kasus Home Industri Jenang Kenep Sukoharjo) (Production Cost in Packaging Design Innovations of Culinary Product (Case Study of Jenang Kenep Sukoharjo Home

Industry))," in *Seminar Nasional dan The 5th Call For Syariah Paper (SANCALL) 2018*, 2018.

[4] I. F. Nurmuhametov, R. G. Kaspina and N. N. Davletshina, "Revisiting the Application of the ABC System in the Packaging Industry Companies," *Mediterranean Journal of Social Sciences,* vol. 5, no. 24, pp. 231-236, 2014.

[5] PT Perkebunan Nusantara VII, "ptpn7," [Online]. Available: https://www.ptpn7.com/Bisnis/teh. [Accessed 22 December 2022].

[6] R. W. Hilton and D. E. Platt, Managerial Accounting: Creating Value in a Dynamic Business Environment, New York: McGraw Hill Education, 2017.

[7] Binus University, "Binus University: School of Accounting," 16 July 2019. [Online]. Available: https://accounting.binus.ac.id/2019/07/16/memahami-fraud-dalam-laporan-keuangan/. [Accessed 23 December 2022].

[8] D. Al-Eidan, M. Al-Ahmad, M. Al-Ajmi, N. Al-Sayed, R. Al-Ajmi and W. Smew, "Activity-Based Costing (ABC) for Manufacturing Costs Reduction and Continuous Improvement: A Case Study," in *Proceedings of the International Conference on Industrial Engineering and Operations Management*, Pilsen, 2019.

[9] W.-H. Tsai, P.-Y. Chu and H.-L. Lee, "Green Activity-Based Costing Production Planning and Scenario Analysis for the Aluminum-Alloy Wheel Industry under Industry 4.0," *Sustainability,* no. 11, p. 756, 2019.

[10] C. Ju-fang and Y. Kun-yuan, "Application of Activity-Based Costing in Customer Profitability Analysis," in *2008 International Seminar on Business and Information Management 2008 International Seminar on Business and Information Management 2008 International Seminar on Business and Information Management 2008 International Seminar on Business and Information*, Wuhan, 2008.

[11] T. Kucera, "Application of the Activity-based Costing to the Logistics Cost Calculation for Warehousing in the Automotive Industry," *Communications,* vol. 21, no. 4, 2019.

[12] M. Fei, Y. Hua, S. Bao-feng and W. Meng-na, "Remanufacturing System Cost Management Based on Integration of Target Costing and Activity-Based Costing," in *2008 International Conference on Information Management, Innovation Management and Industrial Engineering*, Taipei, 2008.

[13] P. Quesado and R. Silva, "Activity-Based Costing (ABC) and Its Implication for Open Innovation," *J. Open Innov. Technol. Mark. Complex.,* vol. 7, no. 41, pp. 1-20, 2021.

[14] J. M. Rohani, N. A. Azman and M. H. Zakaria , "Development of Activity-based Costing in Fabrication Company: A Case Study," *Jurnal Mekanikal,* vol. 38, pp. 44-52, 2015.

[15] D. R. Hansen, M. M. Mowen and L. Guan, Cost Management: Accounting & Control, Mason: South-Western Cengage Learning, 2009.

[16] W. K. Carter, Akuntansi Biaya (Cost Accounting), Jakarta: Penerbit Salemba Empat, 2009.

[17] A. Watanapa, S. Pholwatchana and W. Wiyaratn, "Activity-Based Costing Analysis for Train Station's Service," *Engineering Journal,* vol. 20, no. 5, pp. 135-144, 2016.

[18] Supriyono, Akuntansi Manajemen (Management Accounting), Yogyakarta: BPFE UGM, 1993.

[19] S. Purwati. [Online]. Available: https://docplayer.info/227191260-Processing-teh-tanaman-teh-pada-pt-perkebunan-nusantara-iv-unit-bah-butong-sumatera-utara-sri-purwati-w-w-m-b-a-ak-ca.html. [Accessed 22 December 2022].

[20] P. D. Kimmel, J. J. Weygandt and D. E. Kieso, Financial Accounting: Tools for Business Decision Making, Wiley, 2016.

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