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Cost of Goods Manufactured (COGM) Calculation Using Activity-Based Costing Method in Manufacturing Companies: A Case Study of CV. YYY

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Abstract

One of the most challenging issues faced by the manufacturing industry is managing production process costs, particularly in companies with a high variety of products. The use of conventional costing methods, which allocate overhead costs to a single cost driver, often fails to reflect actual production conditions, resulting in reduced accuracy in determining the Cost of Goods Manufactured (COGM). CV. YYY, as a multi-product manufacturing vendor, faces similar issues due to process complexity and the shared use of machinery, resulting in disproportionate cost calculations. This study applies the Activity-Based Costing (ABC) method to calculate COGM for eight product types. Data was obtained through observation, interviews, and documentation, then analyzed by six stages such as: identifying activities and activity cost pools, identifying direct and indirect costs, allocating indirect costs to each activity pool, determining cost drivers, calculating activity rates, and allocating costs to each product unit based on their respective cost drivers. The research results indicate that the ABC method provides more accurate and realistic cost calculations than the traditional method by allocating overhead costs proportionally based on actual activity consumption. Relying on traditional costing may distort unit production costs and pricing decisions; therefore, adopting ABC is essential for improved cost accuracy.

Keywords: Multi-Products, Manufacturing Industry, Cost Of Good Manufactured (COGM), Activity-Based Costing (ABC)

1. Introduction

Manufacturing industries face significant challenges in managing production costs amid fierce global competition (Keil, 2024; Rounaghi et al., 2021). One of the problems often encountered is the inaccuracy of the cost of goods manufactured (COGM) calculation, particularly in the allocation of factory overhead costs (Alami & ElMaraghy, 2021; Handoko & Rasyid, 2024; Nørgaard et al., 2025). It happens because manufacturers often calculate COGM using a conventional approach that simplifies calculations by assuming equal indirect costs across all products (Larasati & Wijayati, 2024). The conventional approach often relies on a single cost

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driver, failing to account for the complexity of modern production processes (Nørgaard et al., 2025; Quesado & Silva, 2021). Thus, inaccuracy in determining COGM can increase the risk of a decline in the company's potential profits.

CV. YYY, as one of the manufacturing vendors receiving multi-product production orders, is also susceptible to experiencing these issues. The variety of products processed through different stages with overlapping use of the same machinery further complicates the problem. To date, CV. YYY has been allocating production costs across products using the same method, despite varying levels of complexity. This equivalent allocation to different processes results in inaccurate cost calculations. Consequently, the determination of production costs becomes inappropriate.

To address this issue, the Activity-Based Costing (ABC) method emerges as a solution that can provide cost allocation calculations according to the complexity level of the process (Saeed et al., 2023). The ABC method allocates overhead costs to activities that consume related resources, rather than solely to production volume. This method identifies specific cost drivers for each activity, so that overhead costs are charged proportionally based on the activities experienced by each product type (Lidiani, 2022; Setyawan, 2025).

2. Literature Review

The ABC method has been widely used to calculate COGM, as revealed in previous studies (Putra et al., 2025; Quesado & Silva, 2021; Saeed et al., 2023). The number of studies conducted shows a positive trend and continues to increase over the past 30 years, particularly in the manufacturing and healthcare sectors (Sánchez-Rebull et al., 2023). This indicates that applying the ABC method to production cost calculations can address the limitations of traditional calculations (Rexhepi et al., 2024).

In the research conducted by Rexhepi et. al. (2024), they provide a detailed explanation of the ABC method for determining cost allocation to final products. Rexhepi et. al. (2024) explain that the ABC method is a cost calculation approach based on the assumption that costs are not incurred by the products being processed, but rather arise from the activities undertaken by the products during the manufacturing process. Furthermore, these activities consume resources according to the production process, which are then charged proportionally to each product type (Rexhepi et al., 2024). Through a comprehensive conceptual review and a case study of a manufacturing company, Rexhepi et. al. (2024) revealed that traditional cost calculation methods tend to result in cost inaccuracies when companies produce a high variety of products and have a significant proportion of overhead costs. This occurs because traditional methods rely solely on unit-based cost drivers. Consequently, high-volume products tend to subsidize low-production products (Rexhepi et al., 2024).

In the context of local companies in Indonesia, the ABC method has been widely implemented through recent studies (Abizar et al., 2025; Ambia et al., 2024; Hidayat et al., 2024; Larasati & Wijayati, 2024; Prasetyo et al., 2024; Turnip et al., 2024). implemented this method at PT. S, a cardboard manufacturer, identify activities such as purchasing with purchase orders as the cost driver, production with production time as the cost driver, and shipping and administration with sales orders as the cost driver. Meanwhile, Abizar (2025), Ambia et. al., (2024), Hidayat et. at., (2024), and Prasetyo et. al., (2024) applied this method to calculate production costs for no more than 5 products, considering activities identified with direct labor hours as the cost driver. However, Ambia et. al., (2024) differed in using an additional cost driver for the activity of delivering goods to customers, namely delivery frequency. Furthermore, Turnip et al., (2024) employed the ABC method in product production processes with more diverse cost drivers,

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including purchase quantity, processing time, unit quantity, and distance. These studies demonstrate that calculating production costs using the ABC method provides more proportional cost allocation to each product and can increase production cost efficiency. Thus, the use of this method can provide policy makers with more comprehensive insights, particularly on how this model can be considered in determining prices, which in turn affects company profits (Prasetyo et al., 2024).

Although numerous studies have demonstrated the effectiveness of the ABC method in determining production costs, its implementation is not without challenges. The greatest challenge lies in the understanding and commitment of management, which are crucial factors for successful implementation (Gultom et al., 2023). Therefore, this study aims to provide a comprehensive overview for policymakers at CV. YYY, enabling production cost calculations that consider differences in cost drivers that may occur in each activity. By optimizing calculations based on relevant cost drivers in each activity, operational process efficiency can be further enhanced (Setyawan, 2025; Suprihadi & Oktaviana, 2025; Yahya et al., 2024).

Furthermore, in line with Rexhepi et. al., (2024), this study employs the ABC method due to the variety of products manufactured by CV. YYY, totaling 8 products processed through different stages with overlapping use of the same machinery. With multiple product variations and shared machine usage, implying that one machine can process several different products, overhead costs should be calculated proportionally rather than uniformly. This ensures that the cost calculation for each product component accurately reflects the actual cost proportion. This approach also aims to enable clients ordering specific products to receive a fair and corresponding price.

3. Research Method

3.1. Approach and Analytic Method

This study employs a quantitative, analytical-descriptive approach based on ABC, enabling more accurate cost-of-production calculations for 8 products manufactured by CV. YYY (Creswell & Creswell, 2023). The ABC-based analytical-descriptive method is used to systematically and accurately describe the calculation of production costs based on activities in CV. YYY's production line. The ABC approach involves several stages, including: 1) identifying activities in the production process; 2) assigning costs to each activity; 3) identifying cost drivers for each activity; and 4) allocating costs to each product type (Popesko, 2010). The research design utilizes an activity analysis principle that emphasizes tracking costs to each activity based on cause-and-effect relationships (Blocher et al., 2022) and calculates activity rates for each activity (Alsayegh, 2020). Accordingly, data will be processed through 6 stages, such as: 1) identifying activities and activity cost pools, 2) identifying direct and indirect costs, 3) allocating indirect costs to each activity pool, 4) determining cost drivers, 5) calculating activity rates, and 6) allocating costs to each product unit based on their respective cost drivers. This approach enables comprehensive identification of value-added and non-value-added activities to support continuous improvement (Hilton & Platt, 2023). Furthermore, analysis is conducted by comparing the results of traditional methods with those of the ABC method.

3.2. Research Object

The object of this research is the production line of CV. YYY, a manufacturing company acting as a vendor providing production facilities for 8 different product types with varying processes. However, some machines can be used to process different products at the same stage or process. The research data are based on the production plan for January 2026, serving as a baseline for

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determining the production costs for orders in January 2026.

3.3. Data Collection

Data collection involves observation, interviews, and documentation to ensure the reliability and validity of the information. Observations were conducted directly on the production floor to identify actual production activities, calculate cycle times, and understand how resources are utilized in each activity. Interviews were conducted to gather information on activity definitions, usage of existing facilities, current cost calculation structures, and potential cost drivers for each activity. Documentation includes collecting data from the production team on production process outcomes during the period.

4. Result and Discussions

4.2. Activities and costs identification

The results of observations, discussions, and analysis of the production process at CV. YYY reveals that 8 products are processed through various stages. The planned production quantity for January 2026 is outlined, along with 7 main activities in the component manufacturing process: threading (involving two machines), drilling, turning, welding (involving two welding machines), and product storage. Each activity forms a distinct activity cost pool (ACP) with unique process characteristics and resource consumption, resulting in differing costs.

Table 1. Production planning data of CV. YYY for January 2026

No	Comp. code	Production Number (Unit)	Timing of machinery processes for each product (Second)					
			M1	M2	M3	M4	M5	M6
1	ST70B	6.000	30		14	13		
2	D44YY	54.720						15
3	THH4B	2.880					31	
4	YBCG5	5.000					22	
5	T78GH	2.880					21	
6	APV45	4.080		27			13	
7	D85TY	600		20				17
8	X656Z	1.440		32			15	
Production planning at each machinery process (unit)			6.000	6.120	6.000	6.000	1.6280	5.5320

Source: production planning data of CV. YYY for January 2026

Note:
M1: Threading machine 1
M2: Threading machine 2
M3: Drilling Machine
M4: Lathe Machine
M5: Welding Machine 1
M6: Welding Machine 2

Further identification reveals the costs associated with the production process. Production costs comprise direct costs and indirect costs. Since CV. YYY is a vendor that only receives production processes, with raw materials fully provided by the client, and direct costs consist only of direct labor. Meanwhile, indirect costs or overhead costs include: 1) machine depreciation costs; 2) energy costs; 3) machine maintenance costs; 4) auxiliary material costs; 5) production building maintenance costs; and 6) storage costs for raw materials and work-in-

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progress (WIP) before being processed and sent to the client.

Table 2. Indirect (overhead) costs allocated for production in January 2026

No	Machine	Indirect Cost for Each Machine			
		Machine Depreciation	Energy Consumption	Machine Maintenance	Auxiliary Material
1	M1	Rp 2.777.777,78	Rp 1.266.149,85	Rp 833,333,33	Rp 1.100.000,00
2	M2	Rp 833.333,33	Rp 683.052,44	Rp 250.000,00	Rp 1.100.000,00
3	M3	Rp 175.000,00	Rp 29.741,78	Rp 52.500,00	Rp 100.000,00
4	M4	Rp 1.250.000,00	Rp 55.234,73	Rp 375.000,00	Rp 100.000,00
5	M5	Rp 416.666,67	Rp 745.134,38	Rp 125.000,00	Rp2.279.200,00
6	M6	Rp 416.66667	Rp 1,851,694,59	Rp 125.000,00	Rp7.744.800,00
Total		Rp 5.869.444,44	Rp 4.631.007,75	Rp 1.760.833,33	Rp12.424.000,00

Source: cost planning data at the production department of CV. YYY for January 2026

CV. YYY employs 4 workers operating machines in shifts to produce 8 products, with 2 shifts per day, each consisting of 8 working hours. With 22 working days in a month and a monthly wage of Rp. 5,800,000.00 per worker, the total monthly labor cost is Rp. 23,200,000.00.

The machine-related indirect costs are presented in Table 2. Additional indirect cost components, namely building maintenance costs and storage costs for raw materials and work-in-progress (WIP), are identified as Rp. 20,000,000.00 and Rp. 12,800,000.00, respectively. Consequently, the total indirect costs or manufacturing overhead amounts to Rp. 57,485,285.53.

4.3.COGM Calculation using two methods: Traditional and ABC Method

Traditionally, CV. YYY has calculated production costs using a conventional method, allocating manufacturing overhead uniformly based on total cycle time (CT) without considering relevant activities and cost drivers.

$$Direct\ Cost\ for\ each\ p\ product = \frac{\sum DL}{\sum_{p \in P} N_p} \quad (1)$$

As can be seen in equation (1), the direct cost is calculated by dividing the total direct labor cost per unit period ($\sum DL$) – in this case, the direct labor cost that will be budgeted for January 2026 (unit period is monthly) – by the total number of products planned to be produced in January 2026 (N_p).

$$Indirect\ Cost\ for\ each\ p\ product = ROD \cdot \sum_{m \in M} CT_p^m \quad (2)$$

$$ROD = \frac{\sum BOP}{\sum_{p \in P} \sum_{m \in M} CT_p^m} \quad (3)$$

Furthermore, the factory overhead cost per unit of product p is calculated using a single cost driver, namely the cost per unit time of processing one product across all machines used. Thus, as can be seen in equations (2) and (3), the overhead/indirect cost of each unit of product p is the factory overhead cost rate per second (ROD) multiplied by the total Cycle Time (CT) for product p across all machines m where product p is processed (CT_p^m). In addition, the ROD is

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calculated by dividing the total indirect cost ($\sum BOP$) by the total processing time of all product p across all macines m ($\sum_{p \in P} \sum_{m \in M} CT_p^m$).

Thus, the COGM of each component product p using the conventional method, as commonly practiced by CV. YYY are presented in Table 3.

Table 3. The calculation of COGM using traditional method

No	Comp. code	Direct Cost	Indirect Cost	COGM
1	ST70B	Rp 298,97	Rp 1.955,47	Rp 2.254,44
2	D44YY	Rp 298,97	Rp 514,60	Rp 813,57
3	THH4B	Rp 298,97	Rp 1.063,50	Rp 1.362,47
4	YBCG5	Rp 298,97	Rp 754,74	Rp 1.053,71
5	T78GH	Rp 298,97	Rp 720,44	Rp 1.019,40
6	APV45	Rp 298,97	Rp 1.372,26	Rp 1.671,23
7	D85TY	Rp 298,97	Rp 1.269,34	Rp 1.568,31
8	X656Z	Rp 298,97	Rp 1.612,40	Rp 1.911,37

Subsequently, a recalculation was performed using the Activity-Based Costing (ABC) method, allocating manufacturing overhead costs in proportion to the activities involved.

1) Identifying activities and activity cost pools

The activities involved in producing each product are presented in Table 1, revealing diverse activity processes for each component product processed by CV. YYY. Notably, some processes utilize the same machine. Consequently, the following activity cost pools (ACPs) were identified: ACP 1: Threading using Machine 1, ACP 2: Threading using Machine 2, ACP 3: Drilling, ACP 4: Turning, ACP 5: Welding using Welding Machine 1, ACP 6: Welding using Welding Machine 2, and ACP 7: Storage of raw materials and work-in-progress (WIP).

2) Identifying direct and indirect costs

In this study, direct costs comprise only direct labor. YYY operates as a processing vendor, receiving raw materials from clients and processing them into work-in-progress (WIP) components without supplying the materials themselves, as evidenced by current operations and plans for January 2026. Indirect costs, on the other hand, encompass machine-related costs (Table 4), production building maintenance costs, and storage costs, as previously mentioned in Section 4.1.

3) Allocating indirect costs to each activity pool (ACP)

The allocation of indirect costs using the ABC method is achieved by ensuring that each indirect cost consumed by each activity is appropriately assigned. Based on the case in this research, the indirect costs for each Activity Cost Pool (ACP) are identified by summing up the indirect costs, namely the depreciation cost of the machine m (CD_m), the energy consumption cost of the machine m (CE_m), maintenance cost of the machine m (CM_m), auxiliary material cost at the machine m (CA_m), and building maintenance costs allocated to the machine m (CB_m), as shown in equation (4).

$$Indirect\ Cost\ for\ each\ ACP = CD_m + CE_m + CM_m + CA_m + CB_m \quad (4)$$

Table 4. Indirect cost related to each ACP

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No	Activity Cost Pools (ACP)		*Indirect Cost*
1	Threading components using threading machine 1	Rp	5.977.260,96
2	Threading components using threading machine 2	Rp	2.866.385,77
3	Drilling components using drilling machine	Rp	357.241,78
4	Turning components using lathe machine	Rp	1.780.234,73
5	Welding components using welding machine 1	Rp	3.566.001,05
6	Welding components using welding machine 2	Rp	10.138.161,25
7	Warehousing the raw materials and WIP components	Rp	12.800.000,00

As an example, the calculation of the allocation to ACP 1 with the thread-making activity using threading machine 1, the indirect cost is calculated by summing up the resource consumption only for ACP 1:

$$Rp\ 2.777.777,78 + Rp\ 1.266.149,85 + Rp\ 833.333,33 + Rp\ 1.100.000,00 = Rp\ 5.977.260,96$$

The cost at ACP 1, totaling Rp 5,977,260.96, excludes building maintenance costs as mentioned in formulation 4, due to the differing cost driver for building maintenance costs, which can only be calculated after determining the cost driver in the subsequent step. Thus, building maintenance costs are allocated to ACP after the cost driver is determined; consequently, the costs listed in Table 4 represent indirect or manufacturing overhead costs prior to the allocation of building maintenance costs, which will be distributed to each ACP upon identification of appropriate cost drivers in subsequent steps.

4) Determining cost drivers

Table 5. Cost driver for each ACP

No	*Activity Cost Pool*	*Cost Driver*
1	Threading components using the threading machine 1	- Processing time = indirect costs excluding building maintenance costs - Floor space per machine = indirect costs related to building maintenance - Product units = indirect costs related to building maintenance
2	Threading components using the threading machine 2	
3	Drilling components using drilling machine	
4	Turning components using lathe machine	
5	Welding components using welding machine 1	
6	Welding components using welding machine 2	
7	Warehousing the raw materials and WIP components	- Storage area floor space = indirect costs related to building maintenance - Product units = indirect costs related to building maintenance and storage overhead

Several cost drivers influence the allocation of production costs, particularly indirect costs, to individual products. Machine-related costs, including depreciation, energy, maintenance, and auxiliary materials, are allocated based on the processing time of each product component at each activity, as processing time significantly impacts resource consumption. Building maintenance costs are allocated to products through a two-stage process involving different cost drivers: first, costs are allocated to activities based on occupied floor space, and second, costs are allocated to products based on the number of units produced. Storage costs, driven by the number of product units, are allocated according to the aggregate number of products

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occupying storage space within a given period.

5) Calculating activity rates

Based on the cost driver for building maintenance costs, namely occupied floor space, the allocation of floor space as a percentage of total production area is as follows: ACP 1 (12%), ACP 2 (12%), ACP 3 (7%), ACP 4 (12%), ACP 5 (9%), ACP 6 (9%), and ACP 7 (38%). The activity rate is calculated by dividing the total cost pool by the cost driver as can be seen at equation (5).

$$Activity\ Rate = \frac{Cost\ pool}{Cost\ Driver} \quad (5)$$

As an example, the rate for overhead costs excluding building maintenance costs at ACP 1 is

$$\frac{Rp\ 5.977.260{,}96}{180.000\ detik} = Rp\ 33{,}21$$

Meanwhile, the overhead cost associated with the building at ACP 1 is:

$$\frac{Rp\ 20.000.000\ x\ 12\%}{6.000\ produk} = Rp\ 410{,}26$$

Thus, the results of the calculation are presented in Table 6.

Table 6. Activity rate for each ACP

No	*Activity Rate Pool*	Rates	
		OH excluding building maintenance costs (Rp/second)	**OH related Building Maintenance (Rp/Product)**
1	Threading components using the threading machine 1	Rp 33,21	Rp 410,26
2	Threading components using the threading machine 2	Rp 17,04	Rp 402,21
3	Drilling components using a drilling machine	Rp 4,25	Rp 230,77
4	Turning components using a lathe machine	Rp 22,82	Rp 384,62
5	Welding components using welding machine 1	Rp 10,66	Rp 113,40
6	Welding components using welding machine 2	Rp 12,20	Rp 33, 37
	Warehousing the raw materials and WIP components	**Rate (Rp/Product)**	
7	Threading components using threading machine 1	Rp 264,08	

The majority of activity rate pools exhibit similar rate criteria, which fall into two types: cost per processing second and cost per product unit. Costs calculated per product unit are observed across all activities, specifically building overhead costs in Activities 1-6 and storage costs in Activity 7. Conversely, costs per processing time unit (in this case, seconds) are found in Activities 1-6, where these rates account for machine-related processing time costs.

6) Allocating costs to each product unit based on its respective cost drivers.

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The final step in calculating COGM using the ABC method involves allocating costs to individual product units. Product costs are calculated based on direct costs, specifically direct labor costs, which remain consistent with traditional calculations. Meanwhile, the indirect costs for each ACP are calculated through equations 6 and 7.

$$Indirect\ Cost\ for\ ACP\ 1-6 = \left(\sum_{p\in P} Rate_p\ .CT_p^m\right) + CB_p^m \quad (6)$$

$$Indirect\ Cost\ ACP\ 7 = \frac{\sum BOP\ of\ ACP\ 7}{\sum_{p\in P} N_p} \quad (7)$$

The indirect costs of ACP 1 to 6 are calculated using equation 6, which is the total of indirect costs allocated to each product p, where the indirect cost of each product p is calculated by multiplying the indirect cost rate, excluding building maintenance for each product p ($Rate_p$) by the processing time of the product p at machine m for each ACP (CT_p^m) Plus the indirect costs associated with building maintenance of the product p for each machine m (CB_p^m). For example, in the calculation of indirect costs for Product ST70B at ACP 1, it is known that the indirect cost rate for this product, specifically non-building maintenance indirect costs, is Rp 33.21 per second and the rate for building maintenance is Rp 410.26 per product, then, with the CT of product ST70B at ACP 1 being 30 seconds, the indirect cost charged to product ST70B at ACP 1 is:

$$(Rp\ 33{,}21\ x\ 30\ ) + Rp\ 410{,}26 = Rp\ 1.406{,}47$$

Meanwhile, ACP 7, which is the indirect cost associated with product storage p, is calculated by dividing the total storage cost ($\sum BOP\ of\ ACP\ 7$) – comprising material handling, electricity, security, and building maintenance costs for the storage area – by the total number of products produced ($\sum_{p\in P} N_p$) as shown at equation 7. The storage cost per product is the same because the divisor is the total number of products produced. This aligns with the reality that, even though products are processed differently, their sizes do not differ significantly, so the allocation of storage costs remains the same. The calculation results are shown in Tables 7 and 8.

As shown in Table 7, each product component undergoes different activities, with some overlap in machine usage. From this analysis, the production costs for each product component are determined, as presented in Table 8.

Table 7. Detailed ABC method direct and indirect costs breakdown

No	Comp. Code	*Direct Cost*	*Indirect Cost*						
		TK	*ACP 1*	*ACP 2*	*ACP 3*	*ACP 4*	*ACP 5*	*ACP 6*	*ACP 7*
1	ST70B	Rp 299	Rp 1.406		Rp 290	Rp 681			Rp 264
2	D44YY	Rp 299						Rp 216	Rp 264
3	THH4B	Rp 299					Rp 444		Rp 264
4	YBCG5	Rp 299					Rp 348		Rp 264
5	T78GH	Rp 299					Rp 337		Rp 264
6	APV45	Rp 299		Rp 862			Rp 252		Rp 264
7	D85TY	Rp 299		Rp 743				Rp 241	Rp 264
8	X656Z	Rp 299		Rp 947			Rp 273		Rp 264

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Table 8. Total cost of good manufactured using ABC method

	ST70B	D44YY	THH4B	YBCG5
COGM	Rp 2.941,14	Rp 779,42	Rp 1.007,03	Rp 911,05

	T78GH	APV45	D85TY	X656Z
COGM	Rp 900,39	Rp 1.677,30	Rp 1.547,78	Rp 1.784,82

4.4.*The comparison of COGM between traditional and ABC methods*

The results of calculations using two methods reveal discrepancies in the allocation of production costs for each product. This is attributed to the ABC method's use of multiple cost drivers, grounded in resource consumption at each activity. In contrast, the traditional method employed by CV. YYY relies on a single cost driver, allocating overhead costs uniformly across processing time units (seconds) for all product components.

Table 9 indicates that traditional calculations yield nearly uniform component costs. By equalizing overhead cost allocation weights, the traditional method fails to capture differences in resource allocation across production activities resulting from varying production volumes and machining processes. This highlights a weakness in the traditional method, leading to inaccurate production cost calculations (Saeed et al., 2023). In contrast, the ABC method yields production costs for each product with more varied values. These values reflect the reality that overhead costs should be allocated proportionally according to resource consumption, rather than equally aggregated (Khan & Saleem, 2024).

Table 9. The Comparison of COGM Between the Traditional Method and ABC Method

No	component	Metode Traditional		Metode ABC		Spread	
1	ST70B	Rp	2.254,44	Rp	2.941,14	-Rp	686,70
2	D44YY	Rp	813,57	Rp	779,42	Rp	34,15
3	THH4B	Rp	1.362,47	Rp	1.007,03	Rp	355,44
4	YBCG5	Rp	1.053,71	Rp	911,05	Rp	142,66
5	T78GH	Rp	1.019,40	Rp	900,39	Rp	119,02
6	APV45	Rp	1.671,23	Rp	1.677,30	-Rp	6,07
7	D85TY	Rp	1.568,31	Rp	1.546,78	Rp	21,53
8	X656Z	Rp	1.911,37	Rp	1.783,82	Rp	127,56

The calculations also reveal instances of undercosting and overcosting in the traditional method. Two product components, ST70B and APV45, are undercosted, indicating that their production costs are underestimated. Products with more complex processes and exclusive machine usage should ideally consume more resources compared to simpler products processed on shared machines. For instance, ST70B, processed on three different machines exclusively used for this product, incurs higher costs under the ABC method, reflecting its proportional resource consumption. Additionally, varying processing times on the same machine should lead to differing resource consumption, as seen in APV45, which has a longer processing time than other products on the same machine. The ABC method effectively captures these differences.

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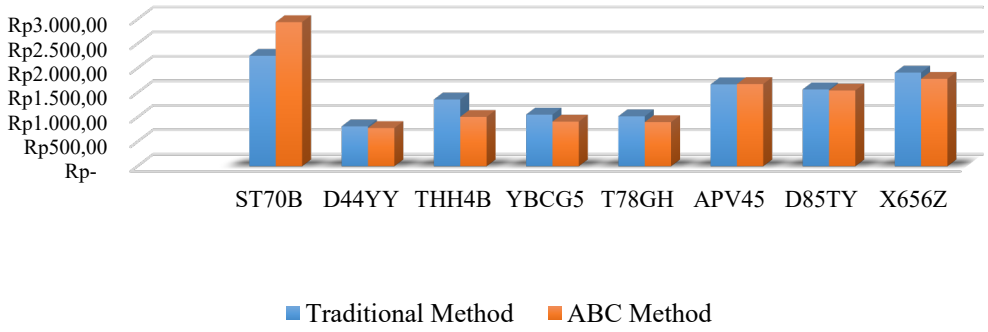


Figure 1. The Comparison of COGM Between Traditional Method and ABC Method

Production costs calculated using two different methods reveal that several product components are overcosted under the traditional method, including D44YY, THH4B, YGCG5, T78GH, D85TY, and X656Z. The ABC method adjusts overhead costs for less complex products, allocating higher costs to more complex products. Thus, applying the ABC method can enhance production cost management effectiveness (Tahang & Hakim, 2023).

Accurately accounting for COGM based on activity-specific resource consumption provides management team a comprehensive insight to evaluate non-value-added activities (Hilton & Platt, 2023; Keil, 2024). This enables reduction of non-value-added activities, potentially lowering COGM and increasing efficiency. The ABC method also evaluates whether ACPs are appropriate or can be optimized. For instance, this case study identified 7 key activities as ACPs, with thread-making and welding being redundant. Considering January 2026 production plans, idle time on duplicate machines (two welding and two threading machines) could be optimized by using one machine per activity, enhancing process optimality and cost efficiency. However, retaining duplicate machines may be justified for contingency purposes during sudden demand spikes, aligning with managerial intent and needs.

5. Conclusion

This study provides policymakers with a more comprehensive basis for determining an accurate production cost plan for January 2026, based on cost drivers aligned with resource consumption at each activity. The results show that the ABC method yields more realistic and varied cost calculations than the traditional method, which allocates overhead costs proportionally rather than aggregating them equally. This methodological difference significantly impacts financial management, particularly production financing for January 2026. Maintaining traditional cost calculations risks distorting per-unit production cost allocation, ultimately affecting quoted production prices for clients. Therefore, implementing the ABC method is necessary to achieve more accurate cost allocation.

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