

THE EFFECT OF THE USE OF INVENTORY METHODS AND PRODUCTION PROCESSES ON THE COST OF PRODUCTION UD AZZAHRA JAYA (Slap Rope Making Company)

*Erry Setiawan¹, Agnes Nadya Pitaloka², Agus Sunaryo³

Universitas Mayjen Sungkono, Irian Jaya No. 4, KelurahanKranggan, Kecamatan Kranggan, 61231, Kota Mojokerto, Jawa Timur, Indonesia

Erry944@gmail.com

*corresponding author

Article Information		Abstract
Submission date	4 February 2026	Research Gap: Most prior literature on Cost of Production calculation using the Activity-Based Costing (ABC) framework focuses heavily on large-scale enterprises with established departmental divisions. There is a noticeable empirical gap concerning how ABC behaves in informal, job-order manufacturing MSMEs where raw material inventory records are less structured and prone to material weight deviations during ongoing production stages. Objective: This study aims to analyze the impact of inventory valuation methods and production processes on determining the Cost of Production (HPP) at UD Azzahra Jaya. Furthermore, it compares the accuracy of the company's current Traditional Costing system with the ABC method. Methodology: This research employs a case study design integrating qualitative and quantitative analysis. Data were gathered through direct observations, interviews, and financial documentation spanning 2022–2024. Data analysis techniques include evaluating FIFO stock cards, examining raw material quantity variances, and simulating costs under Traditional and ABC environments. Results: The findings reveal that UD Azzahra Jaya inherently applies the FIFO method per customer orders, but fails to re-weigh materials before processing. This omission causes visible physical quantity variances between documented receipts and actual production usage (e.g., a 0.4 kg discrepancy in Process 1 during June 2024). Consequently, the traditional system distorts product costing by masking waste material. Conversely, the ABC method, integrated with variance controls, yields a highly accurate and realistic Cost of Production across all operational stages. Contribution: Theoretically, this study bridges the cost accounting literature gap regarding ABC implementation and variance management within small-scale manufacturing sectors. Practically, it offers strategic insights for small entrepreneurs to establish rigorous stock cards and re-weighing workflows, ensuring precise product pricing Research aim : Pengabdian Masyarakat Design/Method/Approach : cost accounting Research Finding : COGS Theoretical contribution/Originality : production cost Margareta
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Practitioner/Policy implication : metode ABC

Research limitation : UMKM Dsn Guyangan Ds Wonomlati

Keywords : Cost of Product, FIFO and Variances

1. Introduction

This study aims to analyze the influence of inventory valuation methods and production processes on determining the Cost of Goods Manufactured (COGM) at UD Azzahra Jaya, a rope manufacturing industry in Sidoarjo. The research employs a descriptive quantitative and qualitative method, utilizing direct interviews, field observations, and operational document analysis for data collection. The findings indicate that UD Azzahra Jaya practically applies the First-In, First-Out (FIFO) inventory method, where the procurement of plastic raffia raw materials is adjusted to incoming orders [1]. However, during the production transformation process, the management does not reweigh the raw materials to be processed. Based on sample testing conducted in June 2024, a variance in raw material quantity was identified between formal administrative records and actual physical conditions due to the trimming of damaged materials. This variance significantly impacts the accuracy of raw material cost allocation in calculating COGM. Comparative analysis demonstrates that calculating COGM using the Activity-Based Costing (ABC) method while factoring in these variance values yields a far more precise, efficient, and accurate product cost per kilogram compared to the Traditional Costing System currently utilized by the company[2].

1.1. Statement of Problem

- a. How does the use of the inventory method affect the cost of production at UD Azzahra Jaya?
- b. How does the production process affect the cost of production at UD Azzahra Jaya?

1.2. Research Objectives

- a. To analyze the effect of using the goods inventory method on the cost of production at UD Azzahra Jaya.
- b. To analyze the effect of the production process on the cost of production at UD Azzahra Jaya.
- c. To compare the accuracy of the traditional costing system with the Activity-Based Costing (ABC) method in determining the company's cost of production.

2. Method

The aim is to find out whether the use of inventory methods and several production processes can affect the unit price at the cost of production at UD Azzahra Jaya. Here the author uses qualitative analysis techniques. To answer the formulation of the problem, the author calculates or measurements as follows

2.1. Research Design

This research employs a qualitative design with a case study approach, focusing on product cost analysis (*cost analysis*). The case study approach was selected because this study aims to explore, understand, and analyze in-depth the real-world phenomena of inventory method application, production process variances, and factory overhead cost allocation structures at a specific object, namely UD Azzahra Jaya.

2.2. Data Sources and Observation Period

1. Data Sources:

- a. Primary Data: Obtained directly through in-depth interviews with the owner and the head of production of UD Azzahra Jaya, as well as direct observation of activities on the production floor.
 - b. Secondary Data: Internal company documents including raw material purchase records, actual material usage reports, direct labor payroll lists, and detailed factory overhead costs (electricity, machine depreciation, freight costs, etc.).
2. Observation Period: The data collected and analyzed in this study is limited to the operational period of March - July 2024 to obtain a representative overview of the production cycle.

2.3. Data Collection Techniques

1. Interview: Conducting structured and in-depth question-and-answer sessions with the business owner regarding goods inventory policies (ordering system), production process workflows, cost standard setting, and current factory overhead classifications.
2. Observation: Directly observing the transformation process of raw materials into finished goods to identify the actual activity drivers in the field.
3. Documentation: Gathering purchase invoices, inventory cards, and monthly operational cost records belonging to UD Azzahra Jaya.

2.4. Data Trustworthiness (Validity)

To ensure the validity and trustworthiness of the data in this qualitative research, the author uses Source Triangulation and Method Triangulation techniques:

1. Source Triangulation: Comparing data obtained from interviews with the owner against cross-check data from production workers and written evidence from the company's financial documents.
2. Method Triangulation: Verifying the accuracy of cost data from internal documents by matching them with direct observations of the actual material usage process on the field.

2.5. Data Analysis Procedures and Stages

Data analysis is performed through systematic stages as follows:

1. Data Reduction and Cost Classification: Sorting relevant cost data and classifying them into cost components: Direct Material Cost (BBB), Direct Labor Cost (BTKL), and Factory Overhead Cost (BOP).
2. Raw Material Variance Analysis: Calculating the gap between standard material usage and actual usage using the *Material Usage Variance* (MUV) formula.
3. Existing HPP Calculation (Traditional): Calculating the Cost of Goods Manufactured (HPP) based on the system currently used by the owner (the global accumulation of total BBB + BTKL + BOP).
4. Proposed HPP Calculation (Activity-Based Costing): Implementing the ABC method through its detailed steps.
5. Comparative Analysis and Qualitative Interpretation: Comparing the HPP results from both methods, analyzing the cost distortions (*undercosting* or *overcosting*) that occur, linking them to the company's inventory method, and drawing logical conclusions.

2.6. Detailed Explanation and Rationale for Choosing the ABC Method

1. Rationale for Choosing the ABC Method at UD Azzahra Jaya

The traditional costing system currently utilized by UD Azzahra Jaya tends to allocate Factory Overhead Costs (BOP) uniformly or based on a single volume driver

(such as the number of units produced). In a dynamic manufacturing environment or MSMEs (*UMKM*), the consumption of overhead costs is not always driven by production volume, but rather by support activities (such as machine setup frequency, material handling, or quality control inspections)[3].

The ABC method was chosen because it can accurately trace overhead costs to each activity actually consumed by the product. Consequently, ABC can eliminate cost distortions, resulting in a unit price calculation (HPP) that is more precise, competitive, and reflective of the actual conditions on the production floor [4].

2. Detailed Stages of ABC Method Implementation

In this study, the basic ABC formula is applied through the following structured stages:

- a. Step 1: Identify and Classify Activities Identifying all activities that generate overhead costs at UD Azzahra Jaya (e.g., Machine Maintenance Activity, Material Moving Activity, Quality Control Activity).
- b. Step 2: Trace Costs to Activities (Cost Pool) Determining the total cost for each respective activity group.
- c. Step 3: Determine Cost Drivers Determining the base measure that triggers costs in each activity. *Example:* Machine Setup Activity is driven by the Number of Setup Hours; Delivery Activity is driven by the Frequency of Shipments.
- d. Step 4: Calculate the Activity Rate
- e. Step 5: Allocate BOP to Products BOP is allocated to products based on the actual consumption of each activity:
- f. Step 6: Calculate Total HPP using the ABC Method

3. Results and Discussion /Hasil dan Pembahasan

3.1 Description of the Research Object and Existing Conditions

UD Azzahra Jaya is a manufacturing company engaged in the production of rope made from discarded raffia string plastic waste, located in Krembung, Sidoarjo. In its daily operations, the company manufactures rope based on specific client orders (*Job Order* system). Based on in-depth on-site observations, the administration and cost accounting systems at UD Azzahra Jaya remain highly rudimentary and traditional. The company has not implemented a structured financial or cost accounting workflow; there are no inventory stock cards to monitor raw materials, nor are there formal material requisition forms to track material consumption on the factory floor [5]. Historically, the determination of the Cost of Goods Manufactured (COGM / *Harga Pokok Produksi*) has relied solely on global, aggregate estimates (a traditional costing system). Under this legacy method, total cash expenditures for raw materials, piece-rate outsourced labor, and monthly electricity bills are combined and directly divided by the total production volume, completely bypassing any specific activity-based tracing [4].

3.2 Real Data Analysis and Material Consumption Variance Calculations

Reconciliation of Raw Material Inventory Data (FIFO Method)

Implementation of Activity-Based Costing (ABC) for COGM Calculation. The execution of the *Activity-Based Costing* (ABC) framework is designed to eliminate the cost distortions endemic to traditional accounting architectures. The implementation of the ABC method at UD Azzahra Jaya is executed through the following operational phases:

1. Activity Identification and Cost Pool Structuring:

- a. Setup/Preparation Activity: Encompasses the re-weighing, sorting, and cleaning of damaged raw raffia components.
 - b. Core Production Activity (Spinning/Milling): The mechanical spinning activity driven by industrial machinery consuming electrical power.
 - c. Drawing/Pulling Activity: The manual task of separating and spooling the output rope, heavily reliant on physical human labor.
 - d. Finishing Activity: Includes cutting away excess rope ends (*generating waste*) and final product *packing*.
2. Cost Driver Determination and Rate Assignment: The cost driver selected for Factory Overhead (FOH / *BOP*)—specifically electricity—is mapped directly to machine runtime hours (working days). For June 2024, the total electricity FOH was recorded at Rp786,240 across an aggregate of 24 working days, yielding a precise overhead rate of Rp32,760 per working day.
 3. Cost Allocation to Products: Overhead expenses are proportionally charged to each production batch based on the exact number of days spent completing that specific customer order.

Table 1. COGM Comparison: Traditional System vs. Activity-Based Costing (June 2024)

Process Description	Traditional COGM (Rp)	ABC Method COGM (Rp)	Cost Distortion Variance (Rp)	Cost Status
Process 1 (4 Days)	43,525,990,00	43,519,300,00	3,690,00	Overstated
Process 2 (6 Days)	61,943,310,00	61,931,365,00	11,945,00	Overstated
Process 3 (7 Days)	79,082,820,00	79,061,280,00	21,540,00	Overstated
Process 4 (4 Days)	64,588,815,00	64,560,645,00	28,170,00	Overstated
Process 5 (4 Days)	29,012,840,00	29,010,275,00	2,565,00	Overstated

3.3. Analytical Discussion and Theoretical Implications

Analysis of FIFO Methodology and the Waste Phenomenon on Cost Accuracy

Deploying the FIFO method to track inventory at UD Azzahra Jaya theoretically simplifies actual cost tracing, as raw materials are absorbed in chronological sequence to fulfill open orders. However, a severe flaw in the company's internal control is the absolute omission of *waste* accounting. Trimming damaged raffia prior to milling, combined with severe end-cutting during finishing, introduces significant distortions into financial reporting.

Under the traditional COGM method, the monetary value of discarded material scrap is incorrectly capitalized into the cost base of the finished ropes. Consequently, the traditional COGM figures become universally inflated (*overstated/overcosting*) [6]. By matching non-productive, discarded trash (*waste*) expenses directly to prime units, the resulting accounting data loses integrity and masks severe operational inefficiencies embedded within the plant floor.

Activity-Based Costing (ABC) as an Antidote to Strategic Cost Distortion

As demonstrated in Table 4.2, calculations using the ABC framework consistently yield lower, more precise COGM values compared to legacy accounting systems. The distortion gap spans from Rp2,565.00 to Rp28.170.00 across the various production

processes. This variance emerges because the ABC model maps Factory Overhead (electricity) metrics strictly against a realistic operational driver: actual working days absorbed by a specific job. Traditional methodologies simply pool overhead or spread it arbitrarily, ignoring the real volume of utility assets consumed by a given process [7]. By properly tracking real resource usage and isolating unabsorbed raw material scrap, the ABC method equips management with cost data free from cross-product cross-subsidization.

Literature Convergence and Divergence (Comparative Analysis)

The empirical insights derived from UD Azzahra Jaya present a valuable contrast when positioned alongside historical literature. This discovery explicitly diverges from the conclusions presented [7] at Toko Luvena, which determined that implementing FIFO had zero significant impact on modifying corporate profitability margins. This analytical divergence is theoretically driven by the business models under review; Toko Luvena is a retail trading venture, whereas UD Azzahra Jaya is a manufacturing entity facing complex physical material transformations.

Conversely, this study strongly aligns with the operational anxieties highlighted [6] at CV Karya Lestari. [8] emphasizes that weak inventory administration coupled with arbitrary, estimate-driven costing structures leaves an organization highly vulnerable to severe financial losses due to mispriced products. In the context of UD Azzahra Jaya, failing to structure *waste* accounts leaves the company highly susceptible to paper-driven "phantom profits," as non-productive operational costs remain buried inside the valuation of finished goods inventory.

Practical Implications and Internal Inventory Control Recommendations

From a practical standpoint, this analysis demands immediate structural reforms within the operational management of UD Azzahra Jaya. Administrative gaps caused by a complete lack of bookkeeping must be remedied by implementing a perpetual inventory system integrated with routine physical stock ledger card reconciliations. Management must enforce a strict Standard Operating Procedure (SOP) mandating rigorous raw material re-weighing protocols—both upon receiving materials from suppliers and when dispatching them to the production floor [9].

Furthermore, leadership must formalize the monetization of production scrap (*waste*). Defective raffia cutoffs must be systematically pooled, weighed, and logged administratively. If this waste material is subsequently sold back to suppliers or third-party recycling firms, the resulting economic inflows must be recognized under standard cost accounting rules as a direct reduction of total raw material costs for the current period (or recognized as miscellaneous income) [10]. These internal control mechanisms will not only secure absolute precision in future COGM calculations but will also drive genuine cost efficiencies, sharpening the competitive edge of the company's rope products in the market.

4. Conclusion

This study has successfully reconstructed the Calculation of Cost of Goods Manufactured (COGM) at UD Azzahra Jaya by integrating the First-In, First-Out (FIFO) method for inventory valuation and Activity-Based Costing (ABC) for factory overhead allocation. Based on the analysis conducted, it was found that the accuracy of cost assignment significantly increased compared to the traditional methods previously applied by the company.

The implementation of the FIFO method provides chronological certainty regarding raw material cost flows, minimizes the risk of price distortion due to market fluctuations, and reflects a more actual ending inventory value. Meanwhile, the implementation of the ABC method successfully eliminates overhead cost misallocations (*undercosting* or *overcosting*) by assigning costs based on the actual consumption of activities at each stage of the rope production process. The primary academic contribution of this research proves that the synergy between the accuracy of goods flow (FIFO) and the precision of activity assignment (ABC) is capable of generating cost of production information that is precise, transparent, and reliable as a basis for strategic decision-making and competitive selling price determination.

Practical Implications (For the Company)

1. **Transition of Recording Systems:** UD Azzahra Jaya is advised to gradually migrate from traditional accounting methods to an activity-based recording system (ABC), specifically in identifying cost drivers in each production process.
2. **Standardization of Material Movement Documentation:** The company needs to disciplinedly implement inventory control cards to support the effectiveness of the FIFO method, ensuring that the inbound and outbound flows of raw materials are recorded in real-time.
3. **Employee Training:** Conduct basic training on cost accounting records for administrative and production staff so that cost data collection per activity can be carried out consistently.

Recommendations for Further Research (Academic Value)

1. **Expansion of Variables:** Subsequent research can integrate the ABC method with the concept of Time-Driven Activity-Based Costing (TDABC) to measure time efficiency and idle capacity within the MSME sector.
2. **Scope of Financial Analysis:** It is suggested for future researchers to analyze the impact of this COGM accuracy adjustment on the company's long-term profitability projections and tax planning.
3. **Industry Replication:** Similar studies can be conducted in micro and medium-scale manufacturing industries with more heterogeneous product characteristics to test the consistency and reliability of this FIFO-ABC model.

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