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Modern management model for KAREB Bojonegoro cooperative: Integration of ABM, lean six sigma, and RBV and TPB approaches

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Abstract: In global business competition, ABM helps cooperatives such as KAREB Bojonegoro Cooperative achieve cost efficiency without sacrificing quality. KAREB Cooperative's expenditure is very high, reaching IDR158.82 billion in five years, with the main costs on fuel, labor, and maintenance. Optimizing expenditure and cost management is important to reduce waste, increase efficiency, and profitability. Various studies have shown that Lean Six Sigma and ABM methods increase efficiency, reduce waste, and improve financial performance in various industries with proper implementation and intensive training. However, external factors, recent data, and regional variations, with deficiencies in data and methodology, and challenges in lean sigma implementation have not contributed simultaneously. This study offers the Integration of ABM, RBV, and TPB in Lean Sigma at KAREB Bojonegoro Cooperative because it is suspected that the condition of tobacco processing is not optimal and this approach needs to improve sustainable production efficiency. This study will analyze the implementation of ABM and Lean Sigma for cost control and waste reduction in tobacco drying at Kareb Cooperative with the contribution of Resource-Based View (RBV) and Theory of Planned Behavior (TPB) to improve process quality and optimal resource monitoring. This study uses a qualitative model with a case study method to assess the implementation of Activity-Based Management (ABM) in production cost efficiency, linking it with Lean Six Sigma, Resource-Based View (RBV), and Theory of Planned Behavior (TPB). Key informants from Kareb Cooperative Bojonegoro, including the Head of Production, Accounting, and HR, provided insights into the impact of ABM and internal factors on efficiency. The research instruments included in-depth interviews, observation, and documentation, while the research procedure followed a systematic flow to ensure the validity and relevance of the data. This study states that the implementation of ABM at Kareb Cooperative Bojonegoro allocates costs based on actual activities, improving efficiency and cost control. Costs include procurement of materials (Rp24,375,300,000), production (Rp9,216,862,000), and distribution (Rp6,000,000,000). Lean Sigma focuses on reducing waste such as overproduction, defects, and waiting by improving processes and training. The ability is quite large in identifying production inputs and related costs such as fuel (Rp14,375,300,000), raw materials (Rp10,000,000,000), and production and distribution processes. Waste management such as overproduction and waiting, as well as the implementation of ABM and Lean Sigma, aims to increase efficiency and reduce costs. Evaluation and training are carried out to optimize processes and reduce waste. Setting costs based on activities, while Lean Sigma uses the Just-In-Time (JIT) system. Variable costs are optimized, production is controlled to reduce defects,and distribution and storage are improved for cost efficiency. The keys to success are open communication, management support, and intensive training. The implementation of ABM and Lean Sigma in Kareb Bojonegoro Cooperative effectively reduces costs and waste through training, JIT, and process control. These findings are expected to increase productivity, reduce costs, and improve the competitiveness of cooperatives and provide a model for implementing modern management.

Keywords: *Activity-based management, Cost efficiency, Lean six sigma, Process quality, Tobacco.*

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1. Introduction

In an era of increasingly tight global business competition, cost efficiency is crucial to maintaining the continuity of the company. Activity Based Management (ABM) can help.companies achieve cost efficiency without sacrificing quality, especially financial companies, namely village cooperatives. Cooperatives are business entities based on the people's economy and family principles, operating with the values of honesty, openness, and social responsibility. In Indonesia, cooperatives play a strategic role in the local economy, with more than 158 thousand active cooperatives, including the Kareb Bojonegoro Cooperative which serves various levels of society through various services and business units that have developed since 1976.

Tobacco processing expenses at the Redriying Bojonegoro Employee Cooperative (KAREB) are very high considering the total cost reached IDR 158.82 billion in the last five years. With fuel costs, labor wages, and maintenance being dominant, as well as significant fluctuations, this research is important to identify cost efficiencies and controls to reduce waste and improve operational sustainability. Optimizing expenses and cost management will greatly affect KAREB's profitability and competitiveness in the market. [tobacco production process at the Redriying Bojonegoro Employee Cooperative, from input to output, to improve efficiency, reduce waste, and ensure product quality that meets customer standards. In the period 2018 to 2022, there were dominant costs covering maintenance costs, the dominant of which was machine maintenance, with a total cost reaching IDR 10,487,948,109 from 2018 to 2022. This cost shows high consistency and a significant increase compared to other maintenance categories, indicating that machines are the main component in operations that require the largest budget allocation to maintain efficiency and operations. In the work system model that has been carried out so far, two approaches have been used, namely the daily system and the output-based system. In the daily system, 100 workers are paid Rp100,000 per day with a total cost of Rp260,000,000 per month. The ideal output expected is 26,000 units per month, but the actual output reaches 20,800 units, resulting in a cost per unit of Rp12,500 and a cost waste of Rp52,000,000. In contrast, the output-based system pays workers Rp10,000 per unit of output with a total cost of Rp208,000,000, reflecting a more efficient cost per unit of Rp10,000. The ideal and actual output remain 26,000 and 20,800 units per month, without any cost waste. The output-based system provides more direct incentives based on work results, reducing cost waste and increasing efficiency compared to the daily system. Since 2018 to 2022, it shows a trend of fluctuating residual fuel costs. In 2018, fuel costs reached around IDR 12.1 billion, but there was a significant increase in 2019 to around IDR 14.2 billion. In 2020, fuel costs decreased to around IDR 13.0 billion, but increased again to IDR 14.0 billion in 2021 and IDR 14.3 billion in 2022. Not only that, the procurement of fuel and daily labor is ineffective, with costs reaching IDR 12.1 billion in 2018 and IDR 14.3 billion in 2022. Rework and used pallets also cause waste. In contrast, the barcode system, production layout, and output recording are effective.

Activity Based Management (ABM) Studybased on findings(Fred van Raaij et al., 2020).The research method used a survey of couples to collect data on financial management and financial outcomes. Results: Synergistic financial management and joint accounts reduced financial problems compared to dominant management.(Palma-Molina et al., 2023).The study design used the 2018 National Survey, propensity score matching approach, physical, environmental, and financial performance analysis. The results showed that grass management technology improves the physical, environmental, and financial performance of dairy farms.(Chiu, 2023).The research method in this article is a critical analysis of the US and UK regulators' approaches to financial innovation, especially in cryptoasset offerings. This study finds that the institutional structure of regulators greatly influences the response to financial innovation.(López-Cabarcos et al., 2024)Fuzzy-set qualitative comparative analysis (fsQCA) study was used to analyze the combination of management practices. The study found five water and waste management configurations sufficient for high food company ratings.(Mi et al., 2024). The study design uses secondary data analysis from 1995-2019 with robust tests and endogeneity controls. Bank market power improves financial reporting quality via increased monitoring, especially for firms reliant on local banks.(Antonini & Gomez-Conde, 2024).The study design uses Difference-in-differences with natural quasi-experiments to measure the impact of regulation. Regulatory-driven EMCS temporarily reduce, but eventually enhance, environmental

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innovation over time.(Wang & Wang, 2022).The study design uses literature analysis, case studies, and risk and management system evaluation. This study shows that blockchain optimizes risk control and efficiency in supply chain financing.(Proença et al., 2023).This study uses panel data of 70 banks to analyze the impact of earnings management on bank efficiency. Earnings management negatively impacts bank efficiency; non-discretionary provisions improve allocative efficiency(Akhter & Azad, 2023).The study used annual bank data from 1318 banks to test the effect of religiosity on earnings management. The results showed that religiosity reduces earnings management in banks and varies across regions.(Szaller et al., 2023).The study design uses model development, cost and revenue calculation, algorithm comparison, agent-based simulation. This study analyzes the cost and revenue of resource sharing platforms, and compares sharing algorithms.(Yan et al., 2024b).In this study, fixed effect model and mediation effect model are used for analysis. Digital inclusive finance reduces agricultural carbon emissions by advancing technology and mechanization.(Dharmayanti et al., 2023a).This research method uses a survey with a questionnaire to the company's managerial representatives. The study shows that SMCS and eco innovation have an effect on sustainable financial performance.(Hoque et al., 2024).The study uses longitudinal data and OLS, PCSE, and FGLS models for analysis. Digital transformation reduces credit and insolvency risk but not liquidity risk in Vietnamese banks.(Paarima et al., 2021).The research method is a quantitative approach with a cross-sectional design and linear regression analysis. Nurse managers have moderate financial skills; training significantly improves these skills.(Khelf et al., 2022).Passenger demand data analysis, operational evaluation and capacity adjustment suggestions. Research shows Algiers metro operations are inefficient, risking financial losses.(Lambri et al., 2024).Design the study using Lean Six Sigma DMAIC, ML models, complexity metrics, PSQA targets. Machine learning and Lean Six Sigma improved plan quality and reduced PSQA failure risk.(Usman et al., 2021).This study used a survey and statistical analysis with 75 participants and three waves of data. Human Capital and Physical Capital affect Financial Condition, with Control Management as a moderator.(Martens et al., 2021).The research method uses stochastic frontier analysis and random effects/truncated regression. Bank efficiency decreases, negatively related to earnings management; bank size does not affect efficiency.(Wu, 2024).The research method includes security analysis, blockchain implementation, and BiLSTM-fused transformer model. The blockchain-based model and BiLSTM-fused transformer improve the accuracy of financial risk identification by 94%.(Zhang, 2024).This study uses a modified random forest model with oversampling and pruning techniques. The improved random forest-based financial model achieved 98.03% accuracy in detecting financial crises. The lean sigma study focuses on the findingsFilardi et al., (2015), Lean Sigma in a multinational oil company in Brazil demonstrated cost and time efficiencies in administrative areas. The studyNunes, (2015), Lean Six Sigma (LSS) has not been able to increase productivity independently and working conditions so that it requires implementation with an undetermined time period. StudyTran et al., (2020), Lean Six Sigma improves production efficiency and quality by reducing waste and defects, but is hampered by process complexity and resistance to change. StudiesLighter, (2014), Lean Six Sigma improves pediatric care by increasing quality and reducing costs through in-depth analysis and accurate measurement and requires significant human resource requirements. StudiesIndrawati & Ridwansyah, (2015), lean sigma is able to improve production performance and reduce waste through the DMAIC cycle and the potential for resistance to change and high implementation costs. Herdijanto & Ratnawati's study, (2017), Lean Sigma at a Readymix company in East Java effectively improves operational and managerial performance, requires updating of production machines and limited HR competencies. StudyPereira et al., (2019), Lean Six Sigma improves the efficiency of the mold production process by increasing OEE by about 20%, but there are things that hinder the process related to operator skills and the need for machine programming. The studyPark et al., (2020), Lean Six Sigma in the Industrial Era 4.0 offers advantages in simplicity, speed, and intelligence based on Big Data and AI. It requires the need for rapid adjustment and new skills in advanced data analysis. StudyAlhuraish et al., (2016), lean sigma is able to improve the performance of innovation and industrial operations with the AHP method, but limited implementation can result in weak performance. StudyQiu et al., (2020), Lean Six Sigma in auto parts production is the improvement of efficiency and reduction of production costs, which increases the competitiveness of the brand.

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StudyScala et al., (2021), Lean Six Sigma, through effective implementation reduced the pre-operative length of stay of femoral fracture patients by 39%, improving the efficiency and quality of hospital services, thus requiring continuous monitoring and adjustment to maintain the results. The studyNgoc et al., (2023), to achieve Lean Six Sigma productivity and quality by reducing waste and variation, resulting in better efficiency and performance, requires large investments and intensive training to succeed.

Existing studies are limited in investigating the influence of external and individual factors on household financial management, as well as the lack of recent data and technology adoption. The limited focus on developed country regulators makes the generalization of the results less relevant globally. This study also does not consider regional variations, long-term data, and external factors that affect efficiency and risk management. In addition, there are shortcomings in empirical studies, self-reported data, and cross-sectional designs, as well as the lack of consideration of religiosity variables and specific conditions such as post-pandemic or practical implementation of technology. In dealing with limitations in the administrative process due to less significant behavioral aspects.The need for a combination of lean sigma to accelerate the productivity process of industrial processes. The need for its implementation of a combination of lean sigma with other methodologies in order to minimize obstacles due to process complexity and resistance to change. Complex implementation and large resource requirements. Potential resistance to change and high implementation costs. Limited machine age and HR competency. Lack of operators and machine programming. The need for rapid adjustment and new skills in advanced data analysis. Improving the performance of industrial innovation and operations with the AHP method, but limited implementation can result in weak performance. However, its weakness is its dependence on appropriate adaptation to market conditions and limited company risk. However, long-term implementation requires continuous monitoring and adjustment to maintain results. Automation requires large investments and intensive training to succeed. Thus, there are main factors, namely human resources in the organization need to monitor attitudes, norms, behavioral control to the company's revolution in the production process.

Activity Based Management (ABM) and lean sigma studies have not been achieved quickly, they can be based on organizational activities, namely they can be reviewed with the Resource-Based View (RBV) and Theory of Planned Behavior (TPB), so that the production process requires a Resource-Based View (RBV) as in the findings.(Davis & DeWitt, 2021), revealing the impact of the digital revolution on corporate sustainability and transformation. Findings(Kessler, 2013), shows that RBV explains competitive advantage and economic rents through unique resources and capabilities that are difficult to imitate. The study(Bosnjak et al., 2020), shows that the integrative model of Theory of Planned Behavior (TPB) is better at predicting consumption. The study(Kan et al., 2016), revealed that TPB predicts behavior through behavioral intentions influenced by attitudes, subjective norms, and perceived behavioral control. the application of Lean Sigma methodology that integrates Activity Based Management (ABM), Resource-Based View (RBV), and Theory of Planned Behavior (TPB) in the context of the Kareb Bojonegoro Cooperative. Lean Sigma, which combines the principles of Lean Manufacturing and Six Sigma, is applied to improve production efficiency and quality by identifying and reducing waste and variability(Komari et al., 2022; Pradana et al., 2020; Sulistyadi & Hutabarat, 2024). ABM integration allows for more detailed mapping of activities that affect production costs, while RBV emphasizes the use of valuable internal resources to create competitive advantage.(Anand et al., 2005; Trussel & Bitner, 1998). On the other hand, TPB explains how attitudes, subjective norms, and perceptions of control affect the implementation of Lean Sigma. Not only that, the existing conditions have used a work system with a daily system approach and an output system, so that an in-depth approach can be carried out using RBV and TPB as the key to efficiency and cost control, especially when comparing these work systems, by optimizing resources and attitudes towards efficiency methods.

This study is to analyze the implementation of Activity Based Management (ABM) in controlling production costs in the tobacco drying unit at the Kareb Bojonegoro Cooperative and to identify waste reduction through the Lean Sigma method. The focus of this study is to explore how ABM can manage production costs more effectively and reduce waste in the tobacco processing process using Lean Sigma.

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This study will also assess the integration between ABM and Lean Sigma to improve operational effectiveness and efficiency.

With this approach, it is expected to identify optimal strategies that can increase productivity and reduce costs, so that the Kareb Bojonegoro Cooperative can improve its competitiveness in the market and achieve higher operational efficiency, providing new insights into the application of modern management theory in the tobacco processing sector. The results are expected to not only increase the efficiency and competitiveness of cooperatives, but also provide a model that can be applied to other industries with similar challenges.

2. Research Methodology

2.1. Design

The research design uses a qualitative approach with a case study method to examine the application of Activity Based Management (ABM) in production cost efficiency, while linking it to Lean Six Sigma, Resource-Based View (RBV), and Theory of Planned Behavior (TPB).(Anand et al., 2005; Purwohandoyo, 2018; Sénéchal & Tahon, 1997). Qualitative approaches allow for an in-depth understanding of the impact of ABM, especially in the context of Lean Six Sigma which emphasizes quality improvement and waste reduction.(Ardianto et al., 2024; Qiu et al., 2020). RBV provides a perspective on how valuable internal resources, including employee capabilities and experiences, can influence ABM implementation outcomes. TPB explains how employee attitudes and subjective norms and perceived control over change influence the success of implementing managerial strategies.(Behavior, 2024; Bosnjak et al., 2020). By combining these three theories, this study aims to comprehensively evaluate the effectiveness of ABM in improving production cost efficiency and provide insight into the influence of internal and behavioral factors on these results.

2.2. Research Informants

As part of this research, three key informants from the Kareb Bojonegoro Cooperative were involved to gain in-depth insight into the application of Activity Based Management (ABM) in production cost efficiency.(Goldkuhl et al., 2020; Rotikan, 2013). The informants are the Head of Production, Head of Accounting, and Head of Human Resources (HR). The Head of Production will provide a perspective on the impact of ABM on operational processes and production efficiency. The Head of Accounting will explain how ABM affects cost management and reporting, as well as its impact on the financial structure of the cooperative. The Head of HR will discuss how employees' attitudes and perceptions are towards the changes implemented in the managerial system, and how this affects the effectiveness of ABM implementation.

2.3. Operational Research Variables

Activity-Based Management (ABM) is a management approach used to manage company activities with a focus on efficiency and effectiveness.(Yan et al., 2024a). Through two main dimensions—cost and process—ABM helps identify and analyze value-added activities to be improved and non-value-added activities to be reduced or eliminated. The cost dimension focuses on the accuracy of cost allocation to products or customers, while the process dimension assesses the performance of activities to minimize tobacco production costs at the Redriying Bojonegoro Employees Cooperative (KAREB). The main goal of ABM is to improve company efficiency and reduce waste, so that the quality of service to consumers is maintained without excessive costs.(Antonini & Gomez-Conde, 2024).

Lean Six Sigma is a methodology that combines Lean and Six Sigma principles to improve the efficiency and quality of business processes. By identifying and eliminating waste, and reducing variation and defects in tobacco products at Redriying Bojonegoro Employee Cooperative, Lean Six Sigma helps organizations improve process flow, reduce costs, and improve the quality of tobacco products or services for end customers and distributors.(Talapatra & Gaine, 2019). This methodology also increases customer satisfaction and more efficient use of resources. In addition, Lean Six Sigma empowers employees to participate in continuous improvement, increasing their motivation and

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responsibility for the quality of work. Thus, organizations can achieve sustainable operational excellence.

Resource-Based View (RBV) is a management theory that emphasizes the importance of valuable, rare, and difficult-to-imitate internal resources as the key to achieving competitive advantage.(Davis & DeWitt, 2021). RBV focuses on how firms can leverage their internal assets and capabilities to create sustainable value and advantage.(Nguyen & Dao, 2023). KAREB can implement RBV by leveraging its internal resources, such as employee experience, production capabilities, and supplier relationships, to achieve competitive advantage. By identifying and optimizing valuable resources, KAREB can improve tobacco production efficiency and reduce waste, thereby improving its competitiveness in the market.

The Theory of Planned Behavior (TPB) is a psychological theory that explains that individual behavior is influenced by intentions, which are determined by attitudes toward behavior, subjective norms, and perceptions of behavioral control.(Fraccascia et al., 2023). TPB explains how these factors influence individual decisions and actions. TPB can be used to understand how employee attitudes, subjective norms within the organization, and perceived control over the improvement process influence the implementation of Lean Sigma and ABM strategies at KAREB.(Duong, 2023). By increasing positive attitudes toward change, strengthening support from subjective norms, and improving perceptions of control over managerial initiatives, KAREB can increase the success of implementing efficiency and cost control methods.

2.4. Research Instrument

The research instrument includes in-depth interview activities, observation, and documentation to collect critical data in implementing Activity-Based Management (ABM) and Lean Sigma in the tobacco processing process at the Redrying Bojonegoro Employee Cooperative (KAREB). In-depth interviews identify costs in each tobacco processing unit and the stages of the process, essential for ABM in allocating costs accurately and increasing efficiency. Observations provide direct insight into the interactions between suppliers, raw materials, labor, machines, and other processes, which are essential for the implementation of Lean Sigma. Documentation supports ABM and Lean Sigma data by collecting production, quality, and logistics reports, as well as data on customers and distributors, ensuring efficient management and quality improvement along the value chain.

2.5. Research Procedures

This study uses a systematic flow procedure for data collection, reduction, presentation, and drawing conclusions to ensure the validity of data and the relevance of information related to the implementation of Activity-Based Management (ABM) in the Kareb Bojonegoro cooperative.(Bouwer & Dirkx, 2023; Dharmayanti et al., 2023a). Data collection through interviews and direct observation allows researchers to deeply understand operational activities and cost management.(Kaklis et al., 2023; Noorhayati & Fahyuni, 2024). The data reduction process filters relevant information, groups data for in-depth analysis, and avoids bias. Presenting data in narrative and matrix forms facilitates interpretation, while verification and drawing conclusions ensure findings are valid, credible, and in line with the research focus.

3. Results and Discussion

3.1. Results

3.1.1. Implementation of the Activity-Based Management (ABM) Concept to Control Production Costs in the Tobacco Processing Unit at the Kareb Bojonegoro Cooperative

Observation results related to ABM practices show a breakdown of costs and processes for each main activity. In material procurement, variable costs include fuel procurement of Rp14,375,300,000 for ordering and delivery, and raw material procurement of Rp10,000,000,000 for ordering, inspection, and storage. In the production stage, fixed costs consist of raw material processing of Rp5,000,000,000, which includes preparation, processing, and quality inspection, and production layout arrangement of Rp1,000,000,000, including layout design and implementation. Machine maintenance and upkeep is a variable cost of Rp3,216,862,000, for routine inspection and repair. In distribution and packaging, fixed

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costs include tobacco packaging of Rp2,000,000,000 for packaging and inspection, and tobacco storage before delivery of Rp1,500,000,000 for storage and stock monitoring. Transportation of products to customers, amounting to Rp2,500,000,000, is a variable cost for scheduling and shipping.

The implementation of ABM at the Kareb Cooperative focuses on efficiency, especially in the drying and manual processing units.

> *The ABM and Lean Sigma implementation process began with identifying the need for efficiency in all our lines, especially in the tobacco drying and processing unit, which still uses a lot of manual labor (Head of Production)*

Implementing ABM improves production cost control, reduces inefficiencies, and increases operational accuracy and efficiency.

> *There have been some significant improvements. Greater cost transparency has allowed us to identify non-value-adding activities. We have become more proactive in looking for ways to reduce or eliminate these costs. It has also helped us in our negotiations with suppliers and in making strategic decisions about investments and pricing. We have seen improvements in operational efficiency and an overall reduction in operating costs (Chief Financial Officer)*

ABM has improved supplier negotiations at Kareb Bojonegoro Cooperative, increasing strategic decisions and operational efficiency. ABM implementation leads to reduced operational costs and improved financial performance by providing accurate cost analysis, optimizing cost allocation, and driving data-driven decisions.

> *The implementation of ABM in our cooperative changed the way we view and allocate costs. Previously, cost allocation was more traditional and pauschal, often based on production volume or overhead. With ABM, we started basing cost allocation on actual activities that consume resources. This helped us better understand the cost per product, service, or customer, making it more accurate and facilitating better decision making (Head of Finance)*

The implementation of Activity-Based Management (ABM) in Kareb Bojonegoro Cooperative improves budgeting accuracy by allocating costs based on actual activities. ABM identifies waste, enables more strategic price adjustments, and improves efficiency and innovation in production processes. This supports better decision-making and more solid financial planning.

> *For Lean Sigma, we focus on improving the process by eliminating non-value-adding steps (Head of Production)*

The Cooperative's Production Head uses the Lean Sigma method to improve process efficiency by eliminating waste of time, resources, and costs. This strategy focuses on product quality and customer satisfaction, integrating the Activity-Based Management (ABM) framework for cost visibility and added value, supporting business sustainability in a competitive market.

Using ABM, we started by mapping activities directly related to production costs and operational expenses (Head of Production)

Kareb Bojonegoro Cooperative implements Activity-Based Management (ABM) to understand the relationship between activities and resource consumption. ABM increases cost transparency and allows cost allocation based on actual activities. This strategy includes reviewing business processes, accurate cost allocation, and performance assessment, which supports effectiveness, efficiency, and sustainable financial performance.

We started with a thorough mapping of all activities in our business processes. This involved developing an activity-based cost model that covered every department. We defined and defined each activity, and attributed direct and indirect costs to each. The introduction of new cost management software greatly supported us in recording and analyzing activity-based costs (Head of Finance)

The introduction of advanced cost management software at Kareb Bojonegoro Cooperative supports the efficient implementation of Activity-Based Management (ABM). The tool improves cost recording and analysis, provides detailed insights, and optimizes resource allocation. This results in tighter control of production costs and increased operational efficiency.

> *The introduction of new cost management software has greatly supported us in recording and analyzing activity-based costs (Head of Finance)*

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The implementation of ABM software in Kareb Cooperative increases cost efficiency by identifying and eliminating non-value activities. This optimizes resource utilization, improves cost planning accuracy, and supports strategic decisions. Simplification of the threshing process reduces process time and defect rate, increasing productivity and operational efficiency according to ABM principles.

3.1.2. ImplementationLean Sigma Method for Waste ReductionAt the Tobacco Processing Unit at the Kareb Bojonegoro Cooperative

Define stage, at Kareb Bojonegoro Cooperative, the production process begins by identifying key suppliers, including suppliers of tobacco raw materials, fuel, and machinery and equipment, which provide important inputs for operations. The identified inputs—raw materials, fuel, labor, and machinery—must be optimized to control costs and improve efficiency. Furthermore, the production process includes various sub-activities such as material procurement, processing, machine maintenance, packaging, storage, and distribution. The output of this process is tobacco ready for distribution and quality reports. Understanding the needs of end customers and distributors is essential to maintaining product quality and consumer satisfaction Figure 1.

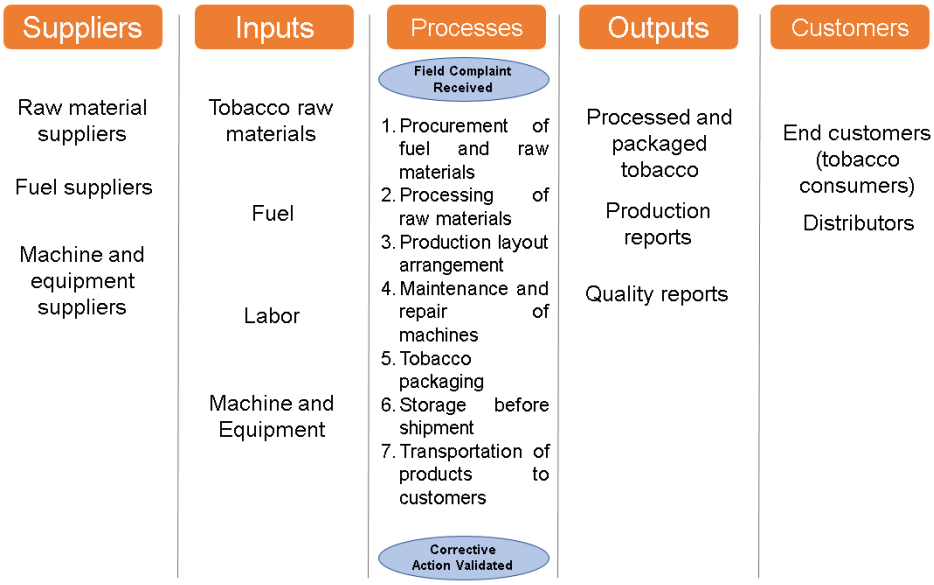

Figure1.
SIPOC diagram.

Table 1.
Cost categorization.

No	Main activities	Sub-activities	Related costs (Rp)	Cost category
1	Procurement of materials	Fuel procurement	14,375,300,000	Variable costs
		Procurement of raw materials	10,000,000,000	Variable costs
2	Production	Raw material processing	5,000,000,000	Fixed costs
		Production layout settings	1,000,000,000	Fixed costs
		Machine care and maintenance	3,216,862,000	Variable costs
3	Distribution & packaging	Tobacco packaging	2,000,000,000	Fixed costs
		Storage of tobacco before shipment	1,500,000,000	Fixed costs
		Transport products to customers	2,500,000,000	Variable costs

Measure stage, in the analysis of the company's operational costs, there are several main categories of costs related to operational activities. Procurement of materials includes procurement of fuel and raw

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materials with variable costs of Rp14,375,300,000 and Rp10,000,000,000 respectively. At the production stage, fixed costs include processing of raw materials of Rp5,000,000,000 and arranging the production layout of Rp1,000,000,000, while machine maintenance and care are variable costs of Rp3,216,862,000. At the distribution and packaging stage, fixed costs consist of tobacco packaging of Rp2,000,000,000 and storage of tobacco before shipping of Rp1,500,000,000, while transportation of products to customers is a variable cost of Rp2,500,000,000. A deep understanding of these costs allows the company to manage and plan operations more effectively Table 1.

Table 2.
Types of waste.

No	Main activities	Sub-activities	Related costs (Rp)	Cost category	Types of waste
1	Procurement of materials	Fuel procurement	14,375,300,000	Variable costs	Transportation
		Procurement of raw materials	10,000,000,000	Variable costs	Supply
2	Production	Raw material processing	5,000,000,000	Fixed costs	Supply
		Production layout settings	1,000,000,000	Fixed costs	Supply
		Machine care and maintenance	3,216,862,000	Variable costs	Defects
3	Distribution & packaging	Tobacco packaging	2,000,000,000	Fixed costs	Unused skills (Skills)
		Storage of tobacco before shipment	1,500,000,000	Fixed costs	Motion
		Transport products to customers	2,500,000,000	Variable costs	Downtime (Waiting)

Measure Stage, the company's operational costs consist of various activities with related types of waste. Procurement of materials includes variable costs for fuel (IDR14,375,300,000) and raw materials (IDR10,000,000,000), with waste in the form of transportation and inventory. Production involves fixed costs for raw material processing (IDR5,000,000,000) and production layout arrangement (IDR1,000,000,000), related to inventory waste, as well as variable costs for machine maintenance (IDR3,216,862,000) which includes defects. Distribution & packaging includes fixed costs for tobacco packaging (IDR2,000,000,000) related to unused skills, tobacco storage (IDR1,500,000,000) related to movement, and variable costs for product transportation (IDR2,500,000,000) related to downtime Table 2.

Table 3.
Resources wasted due to waste.

No	Types of waste	Source	Time	Reason	Wasted resources	Implementation of Improvements	Expected results
1	Waiting (Waiting)	Machine care and maintenance	High machine downtime	Irregular maintenance	Time and labor	Schedule regular maintenance and technician training	Reduce machine downtime, increase operational time
2	Overproduction	Procurement of raw materials	Excess storage	Procurement that does not match needs	Storage space and capital	Implement a just-in-time (JIT) procurement	Reduce excess storage, save space and capital

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						system	
3	Defects	Production of raw materials	Repair of production defects	Inadequate training	Raw materials and labor	Employee retraining and QC improvement	Reduce production defects, save raw materials and time
4	Overprocessing	Tobacco packaging	Excessive packaging	Improper quality standards	Packaging materials and labor	Evaluate and adjust packaging quality standards	Reduce excessive use of packaging materials, save costs
5	Motion (Movement)	Production layout settings	Additional movements	Unoptimized layout	Time and labor	Layout redesign for movement efficiency	Reduces additional movements, increases time and labor efficiency
6	Inventory	Storage of tobacco before shipment	Excess stock	Inefficient inventory management	Capital and storage space	Implement an IT-based inventory management system	Reduce excess stock, save capital and storage space
7	Transportation	Transport products to customers	Over-delivery	Suboptimal consolidation of shipments	Transportation and fuel costs	Consolidate shipments and optimize shipping routes	Reduce transportation and fuel costs
8	Unused Skills	Production of raw materials	Suboptimal use of skills	Inadequate training	Unutilized workforce potential	Training and skills development programs	Optimizing workforce potential, increasing productivity

Types of waste include waiting due to machine downtime, overproduction from excess storage, defects due to production defects, overprocessing from excessive packaging, motion from extra movement, inventory from excess stock, transportation from excess shipping, and unused skills due to inadequate training Table 3.

Overcoming waste in various production activities can be done through the implementation of effective improvements. For waiting, regular maintenance schedules and technician training will reduce machine downtime and increase operational time. Overproduction can be controlled by implementing a just-in-time (JIT) procurement system, which reduces excess storage and saves space and capital. Reducing defects involves employee retraining and improving quality control (QC), which saves raw materials and time. For overprocessing, evaluating and adjusting packaging quality standards will reduce excess packaging material usage and save costs. Motion can be reduced by redesigning the production layout, which increases time and labor efficiency. Excess inventory can be overcome with an IT-based inventory management system, saving capital and storage space. Excess transportation can be optimized by combining shipments and routes, reducing transportation and fuel costs. Finally, unused skills can be overcome with training and skills development programs, optimizing workforce potential and increasing productivity.

Control stage, the application of Lean Six Sigma principles in the tobacco processing unit of Kareb Cooperative involves in-depth analysis to identify and reduce waste at various stages of production. At the input stage, waste arises from residual fuel and suboptimal daily labor, which can be overcome by evaluating alternative fuels and implementing an output-based payroll system. At the process stage, rework and excessive handling add to waste, which can be reduced by job training, quality control, and

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workflow redesign. At the output stage, efficient stock management, packaging, and shipping through FIFO and consolidation of shipments will reduce inventory waste, extra processing, and transportation. Thus, Lean Six Sigma enables increased efficiency and better control of production costs.

Through this dialogue, the research aims to more comprehensively understand the internal and external dynamics that influence the effectiveness of waste reduction, as well as to evaluate the direct impact of Lean Sigma implementation on production efficiency and customer satisfaction.

> *We implemented the 5S technique which aims to organize the workplace. This implementation has reduced search time and significantly improved our workflow (Production Line Operator)*

The implementation of ABM software in Kareb Cooperative increases cost efficiency by identifying and eliminating non-value activities. This optimizes resource utilization, improves cost planning accuracy, and supports strategic decisions. Simplification of the threshing process reduces process time and defect rate, increasing productivity and operational efficiency according to ABM principles.

> *The process began with a series of in-depth training sessions on ABM and Lean Sigma and how these two methods would improve the efficiency of our production process (Production Line Operator)*

To reduce waste at the Kareb Cooperative, ABM and Lean Sigma methods are applied through in-depth training to increase production efficiency.

> *The process of implementing ABM and Lean Sigma began with identifying the need for efficiency in all our lines, especially in the tobacco drying and processing unit, which still uses a lot of manual labor. We conducted a thorough assessment of all activities to see where we could minimize waste and maximize efficiency (Head of Production)*

The implementation of Activity-Based Management (ABM) and Lean Sigma methodologies in the tobacco processing unit at the Kareb Bojonegoro Cooperative focuses on improving operational efficiency to reduce waste. The Head of Production Section described that this process begins with a comprehensive identification of efficiency needs across all operational lines, especially in the drying and processing units which still largely rely on manual labor. From this analysis, a thorough assessment of all production activities is carried out to determine points where waste can be minimized and efficiency can be increased. This initiative involves a systematic evaluation of each step in the production process, allowing the cooperative to identify and then reduce or eliminate steps that are inefficient or do not provide added value. This approach not only improves workflow but also reduces unnecessary operational time, leading to more optimal resource utilization and overall operational cost reduction.

3.1.3. Implementation of ABM methodology along with Lean Sigma principles for Increasing Effectiveness and EfficiencyAt the Tobacco Processing Unit at the Kareb Bojonegoro Cooperative

The implementation of Activity-Based Management (ABM) and Lean Sigma in Kareb Bojonegoro Cooperative aims to improve operational efficiency and reduce costs in various aspects. In material procurement, ABM sets costs based on activities, while Lean Sigma uses the Just-In-Time (JIT) system to reduce procurement and storage costs. The variable cost model is applied to reduce variable costs and save capital through price negotiations with suppliers. In the production stage, ABM sets fixed costs and Lean Sigma improves quality control through employee retraining to reduce production defects. Optimization of cost per unit of product is done by redesigning the layout to improve time and labor efficiency. Machine maintenance is managed by monitoring costs per activity and routine maintenance to reduce downtime. In distribution and packaging, ABM sets fixed costs, while Lean Sigma reduces the use of excess packaging materials through quality standard evaluation. The variable cost system for transportation allows for reductions in transportation and fuel costs through consolidation of shipments and route optimization. Storage is optimized with activity-based costing and IT-based inventory management to reduce excess stock. This strategy improves the efficiency and competitiveness of the cooperative by minimizing waste and costs throughout the chain of operations Table 4.

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Table 4.
Implementation of ABM and lean sigma integration.

No	Main activities	ABM implementation	Lean sigma implementation	Expected results
1	Procurement of materials	Activity-based costing	Implementation of just-in-time (JIT) procurement system	Reduce procurement and storage costs
2		Use of variable cost model	Negotiate the best price with suppliers	Reduce variable costs, save capital
3	Production	Fixed cost determination for processing	Employee retraining and QC improvement	Reduce production defects, improve quality
4		Optimization of cost per product unit	Layout redesign for movement efficiency	Improve time and labor efficiency
5		Monitoring and allocation of costs per activity	Routine machine maintenance	Reduce machine downtime, increase output
6	Distribution & packaging	Fixed cost determination for packaging	Evaluate and adjust packaging quality standards	Reducing the use of excess packaging materials
7		Use of variable cost system for transportation	Consolidate shipments and optimize shipping routes	Reduce transportation and fuel costs
8	Storage	Activity-based storage costing	Implement an IT-based inventory management system	Reduce excess stock, save capital

The full success of this implementation will depend on ongoing monitoring and strategic adjustments in the face of changing operational challenges.

> *My advice is to make sure the entire organization is ready for this change. ABM and Lean Sigma are more than just tools and processes; they are cultural transformations. Engagement and support from the top are crucial, and it is critical that everyone in the organization understands why this change is important and how they can contribute. My advice is to start with a pilot project to get real results and build momentum from there (Director of Kareb Bojonegoro Cooperative)*

The Director of Kareb Bojonegoro Cooperative emphasized the importance of organizational readiness in facing the transformation brought about by the implementation of ABM and Lean Sigma. He said that the key to the success of this transformation lies not only in the tools and processes, but more in the cultural change within the organization. Therefore, strong support from top management is very crucial. The Director recommends starting this implementation with a pilot project that can show real results and help build positive momentum in this change. This will ensure that all members of the organization understand the importance of change and how they can contribute effectively.

> *Communication is key. Start by providing clear and open information about the change, the reasons behind it, and how it will impact each employee. Ensure adequate resources for education and training, and be patient. By listening to employee feedback and making necessary adjustments, you will not only smooth the transition process but also build a stronger, more adaptive company culture (Head of HR)*

The Head of Human Resources of Kareb Bojonegoro Cooperative stated that effective communication is the main key in this transformation process. He suggested that management provide clear and open information about the reasons behind this change and its impact on each employee. By providing adequate resources for education and training and a patient approach, organizations can not only smooth the transition process but also build a stronger and more adaptive company culture. Actively listening to employee feedback and making necessary adjustments based on that feedback will strengthen the process of adaptation and acceptance of change at all levels of the organization.

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The key to success is commitment from the top down. Company leadership must be fully behind the initiative and willing to invest the necessary resources. Additionally, there must be a clear effort to sustain the change, including establishing measurement systems that allow companies to proactively monitor and adjust their processes. And of course, choosing the right partner or vendor—someone who provides not just the tools, but also the insights and support—is critical (ABM and Lean Sigma Consulting Vendors)

Vendors involved in the ABM and Lean Sigma implementation process describe their approach as starting with a thorough analysis of the client's operations to identify areas that could benefit significantly from the implementation of these methods. This process involves interviews with key stakeholders, analysis of operational data, and assessment of existing processes. The recommendations include strategic and tactical changes needed to optimize processes and reduce waste. Vendors also emphasize the importance of commitment from all levels of the organization and selecting the right partner. Selecting a vendor that provides not only the tools but also support and insight is essential to the long-term success of ABM and Lean Sigma implementations.

This communication and alignment of the vision involves a thorough orientation at all levels of management, followed by specific workshops for the teams directly involved. We maintain ongoing communication through various channels, including regular meetings to discuss progress and challenges, and encourage feedback from all levels. It is important to us that this is a two-way dialogue (Director of the Kareb Bojonegoro Cooperative)

The Cooperative Director emphasized the importance of communication and alignment of vision in the process of implementing ABM and Lean Sigma. A thorough orientation process was conducted for all levels of management, followed by a special workshop for the team directly involved in the implementation. Effective communication was maintained through various channels, including regular meetings held to discuss progress and challenges faced. This was not only intended to convey information but also to encourage a two-way dialogue, allowing for feedback from all levels of the organization. This was considered crucial to ensure broad involvement and support for the changes being implemented.

Our biggest challenge was resistance to change. Many employees were initially comfortable with the old way of operating. To overcome this, we held workshops that emphasized the individual and collective benefits of this change. We also used examples from other companies that had successfully adopted similar systems. In addition, we provided space for employees to voice their concerns, which we responded to with constructive feedback (Head of HR, Kareb Bojonegoro Cooperative)

According to the Head of HR, the biggest challenge in this process was resistance to change, especially from employees who were comfortable with the old way of operating. To overcome this, a series of workshops were held that emphasized the individual and collective benefits of implementing this new method. Presentations were made using examples from other companies that had successfully adopted similar systems to demonstrate the potential success that could be achieved. In addition, space was created for employees to voice their concerns, to which management responded with constructive feedback, demonstrating a responsive and inclusive approach to managing change.

Educating clients about the real added value of these investments is critical to gaining their support (ABM and Lean Sigma Consulting Vendor)

Vendors involved in this process expressed the importance of educating clients about the added value of investing in ABM and Lean Sigma. Understanding and communicating the tangible benefits of implementing these methods was considered essential to gaining full support from client management. This education was conducted through informative sessions that demonstrated how these practices could improve operational efficiency and effectiveness.

From interviews with various parties, it is clear that open and effective communication and careful change management are the keys to the successful implementation of ABM and Lean Sigma in the Kareb Bojonegoro Cooperative. By ensuring that all levels of the organization are involved and adequately informed about the process and benefits to be gained, as well as providing space for dialogue and feedback, the Cooperative can increase the likelihood of acceptance and successful implementation. This success depends not only on the tools and techniques applied but also on how the change is managed and communicated to all parties involved.

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We have implemented a more dynamic incentive system, which directly links individual and team performance with recognition and rewards. We offer bonuses, recognition and promotions based on the efficiency and innovation they bring. We also celebrate small successes on a regular basis, which is important to maintain team spirit and motivation….. One of our key initiatives is a mentorship and coaching program. Every employee who faces difficulties with the new system is assigned a mentor. In addition, we hold regular coaching sessions that provide ongoing support and learning to ensure that all employees have the opportunity to develop in accordance with the new system. (Head of HR, Kareb Bojonegoro Cooperative)

The Head of HR emphasized the importance of employee development and motivation in the transition to ABM and Lean Sigma systems. To increase engagement and performance, the cooperative has implemented a more dynamic incentive system, directly linking individual and team performance to recognition and rewards. Bonuses, recognition and promotions are given based on the efficiency and innovation introduced by employees. In addition, small successes are celebrated regularly to maintain team spirit and motivation, which are considered vital in supporting the operational transition. The Head of HR also highlighted the initiative of a mentorship and coaching program as part of employee development. This program is intended to provide support to employees who are facing difficulties with the new system, where each employee is assigned a personal mentor and undergoes regular coaching sessions that help in continuous learning and adaptation.

We provide intensive training to client teams on how to use the new tools, and we include regular Q&A sessions and post-implementation audits to ensure that the changes are taking root. This ongoing engagement is essential to solidify the changes and address any issues that arise during the transition phase (ABM and Lean Sigma Consulting Vendor)

The vendors involved in the implementation stated that they provided intensive training to the client team on how to use the new tools introduced in the ABM and Lean Sigma systems. In addition, they included regular Q&A sessions and conducted post-implementation audits to ensure that the changes introduced were truly rooted in the cooperative's daily practices. The vendors emphasized the importance of continuous engagement as a key factor in reinforcing the changes and addressing issues that emerged during the transition phase. This approach aimed to ensure that all levels of employees felt supported and had the necessary resources to adapt to the new system.

From the results of the interviews conducted, it is clear that training and development are crucial components in the successful implementation of ABM and Lean Sigma in the Kareb Bojonegoro Cooperative. The dynamic incentive system, celebration of success, and mentorship and coaching programs provided by the cooperative, demonstrate a serious commitment in supporting employees during the transition process. In addition, ongoing support from vendors through intensive training and post-implementation audits also play an important role in ensuring the successful and sustainable adoption of the new methodology. All these initiatives are directed to not only improve operational effectiveness and efficiency but also to build a work environment that is adaptive and responsive to change.

This change has transformed the way the team works, with a greater focus on achieving shared goals. We have also redesigned the workspace to promote more intense collaboration and open communication, which supports more efficient daily operations (Head of HR, Kareb Bojonegoro Cooperative)

The Head of HR stated that the changes introduced through the implementation of ABM and Lean Sigma have significantly transformed the way teams work in the cooperative. A greater focus has been placed on achieving common goals, reflecting a transition to a more collaborative work culture. As part of this initiative, the workspace has also been redesigned to promote greater collaboration and open communication. These changes aim to support more efficient day-to-day operations and increase the overall productivity of the team.

Of course, one example is with a manufacturing company that had problems with excess inventory and production lead times. We implemented Lean principles to streamline their workflow, integrating a Kanban-based pull system that ensures components are only ordered and produced as needed. For ABM, we helped them redefine cost allocation based on actual activity, which helped them see the true cost of certain operations and make more informed decisions about where to reduce spending (Industrial Solutions Vendor)

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The industrial solutions vendor explains how they have successfully applied Lean and ABM principles to another manufacturing company that was experiencing similar issues with excess inventory and production lead times. By implementing a Kanban-based pull system, they have helped the company streamline its workflow, ensuring that components are only ordered and produced as needed. Furthermore, ABM was applied to redefine cost allocation based on actual activity, providing clearer insight into the true cost of a particular operation. This approach allows for more informed and strategic decision-making in reducing expenses and optimizing resource use.

4. Discussion

4.1. Implementation of the Activity-Based Management (ABM) Concept to Control Production Costs in the Tobacco Processing Unit at the Kareb Bojonegoro Cooperative

In the Kareb Bojonegoro Cooperative Tobacco Processing Unit, the implementation of Activity-Based Management (ABM) aims to reduce waste and control production costs. ABM maps operational activities to identify and eliminate activities that do not provide added value. At the procurement stage, ABM helps control costs with negotiation strategies and fuel efficiency. At the production stage, improvements in training, production layout, and machine maintenance contribute to reducing costs and product defects. Analysis through the Resource-Based View (RBV) shows that ABM maximizes the use of internal resources, while the Theory of Planned Behavior (TPB) emphasizes the importance of positive attitudes and social support for successful implementation.

This study is in line with the findings(Chiu, 2023), reveals that the institutional structure of regulators greatly influences the response to financial innovation to increase the operational role in value-added efficiency. This study is also in line with(Antonini & Gomez-Conde, 2024)with quasi-natural experiments to measure the impact of regulation can improve the quality ofproduction layout, and machine maintenance. This finding is also in line with(Szaller et al., 2023)And(Akhter & Azad, 2023), explains that religiosity towards earnings management is able to increasenegotiation strategy and efficiency.

The implementation of ABM in Kareb Bojonegoro Cooperative supports transparency and accountability according to cost management guidelines. With the new software, the cooperative maps activities in detail, producing accurate data. This ensures compliance with regulations and strengthens the efficiency and competitiveness of the cooperative in the tobacco processing unit.

4.2. ImplementationLean Sigma Method for Waste ReductionAt the Tobacco Processing Unit at the Kareb Bojonegoro Cooperative

Lean Sigma is a methodology that integrates the principles of Lean Manufacturing and Six Sigma to optimize operational efficiency and quality. Lean focuses on reducing waste and increasing added value, while Six Sigma seeks to reduce variability and improve quality through the DMAIC (Define, Measure, Analyze, Improve, Control) method. This combination helps organizations achieve high efficiency, consistent quality, and cost reduction. Kareb Bojonegoro Cooperative faces major challenges in controlling production costs and reducing waste in the tobacco processing unit. Waste is seen from high expenditures on fuel, labor wages, and maintenance costs. To improve operational efficiency and competitiveness, cooperatives need to implement a structured management approach. The implementation of Lean Sigma in cooperatives begins with identifying and mapping activities that affect production costs.

This study is in line with the findings(Sulistyadi & Hutabarat, 2024), revealed that the implementation of DMAIC in Lean Sigma of Kareb Bojonegoro Cooperative reduces production defects and waste, improves quality and efficiency. This study is in line with(Talapatra & Gaine, 2019), states that it is able to eliminate waste, reduce variation, and minimize environmental impact, so that organizations achieve high efficiency and operational cost efficiency. This finding supports(Dharmayanti et al., 2023b), states that digital adaptability in strengthening the impact of SMCS and environmental innovation on sustainable financial performance for structured management formation modeling.

The use of output-based payroll systems and the search for alternative fuels are solutions to input waste. In the process stage, production defects and excessive motion problems are addressed through

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training and workflow redesign, while the output stage utilizes a First In First Out (FIFO) queuing system and packaging adjustments to improve product delivery efficiency.(Pereira et al., 2019; Pradana, 2021; Pradana et al., 2022). Analysis with the perspective of Resource-Based View (RBV) and Theory of Planned Behavior (TPB) shows the importance of utilizing internal resources and positive management attitudes towards change for the success of Lean Sigma implementation.(Safari & Saleh, 2020; Shannon et al., 2023). The implementation of Lean Sigma in the Kareb Bojonegoro Cooperative supports transparency, accountability, and efficiency through detailed activity mapping, complying with cost management regulations, and increasing the cooperative's competitiveness.(Kuettner & Schubert, 2012; Munawaroh et al., 2024).

4.3. Implementation of ABM methodology along with Lean Sigma principles for Increasing Effectiveness and EfficiencyAt the Tobacco Processing Unit at the Kareb Bojonegoro Cooperative

Lean Sigma combines the principles of Lean Manufacturing and Six Sigma to improve operational efficiency and quality by reducing waste to produce waste that exceeds environmental safety standards and process variability.(Harsito et al., 2021). Kareb Bojonegoro Cooperative implemented Lean Sigma to overcome the challenges of high production costs and waste in the tobacco processing unit. Through activity mapping and in-depth analysis, the cooperative identified waste in fuel and labor costs, as well as production defects and excessive movement problems and accelerated the repair process of tobacco processing machines.(Komari et al., 2022). Improvement measures include seeking alternative fuels, an output-based payroll system, and redesigning workflows. These approaches increase efficiency, reduce costs, and strengthen the cooperative's competitiveness in the market.

The implementation of Lean Sigma in the Kareb Bojonegoro Cooperative maps detailed activities, supports transparency, accountability, and efficiency, and complies with regulations to improve the competitiveness and operational performance of the cooperative.

5. Conclusion and Suggestions

This study has successfully stated that (1) The implementation of ABM in Kareb Bojonegoro Cooperative includes cost allocation based on real activities, such as fuel procurement of Rp14,375,300,000 and raw materials of Rp10,000,000,000. Production costs include raw material processing of Rp5,000,000,000 and machine maintenance of Rp3,216,862,000. This implementation increases efficiency, reduces waste, and supports better decision making by using the latest cost management software. (2) The implementation of Lean Sigma in Kareb Bojonegoro Cooperative aims to reduce waste by focusing on optimizing raw materials (Rp14,375,300,000), production (Rp5,000,000,000), and distribution (Rp2,500,000,000). Evaluation was carried out on the procurement of materials, processing, and distribution of tobacco, including the identification of waste such as overproduction and defects. Implementation of ABM and Lean Sigma includes process improvement through training, JIT system, and layout optimization, increasing operational efficiency and reducing costs. (3) Implementation of ABM and Lean Sigma in Kareb Cooperative, Bojonegoro: Implementation of ABM and Lean Sigma aims to increase operational efficiency and reduce costs. ABM sets costs based on activities, while Lean Sigma uses JIT and routine maintenance to reduce waste. Layout optimization, cost monitoring, and IT-based inventory management increase effectiveness. Success depends on open communication, management support, and intensive training. Implementation of ABM and Lean Sigma in Kareb Cooperative, Bojonegoro increases efficiency, reduces waste, and supports better decision making. ABM allocates costs accurately, while Lean Sigma reduces waste and optimizes processes. This study requires Increase management support, conduct intensive training, and monitor results periodically.

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