

# Analysis of the implementation of standard operating procedures and their impact on production efficiency in MSMEs in bantan subdistrict

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## ABSTRACT

This study aims to analyze the implementation of Standard Operating Procedures (SOPs) and their impact on operational efficiency in small and medium enterprises (SMEs) engaged in food processing in Bantan Subdistrict, Medan. Operational efficiency is a critical factor for sustainability and competitiveness, particularly for SMEs in highly dynamic urban markets. The research employs a quantitative descriptive method with data collected through structured questionnaires and in-depth interviews with 30 SME owners. Key indicators of operational efficiency examined include production time, cost per unit, daily output, and error rates. Data analysis is conducted using linear regression to measure the relationship between SOP implementation levels and operational performance. The results show a significant positive correlation between the application of SOPs and improved production efficiency. Moreover, SMEs that applied written SOPs demonstrated lower production costs and fewer process errors compared to those without structured procedures. However, the study also identifies barriers such as limited managerial knowledge, lack of training, and resistance to change. These findings suggest the need for government-supported training programs and institutional facilitation to encourage formal SOP adoption in SMEs. The study contributes to the literature by highlighting the importance of operational formalization in enhancing SME performance and provides practical insights for local economic policy and SME development strategies.

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## 1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in supporting Indonesia's economy. Data from the Ministry of Cooperatives and SMEs shows that MSMEs contribute more than 60% to the national Gross Domestic Product (GDP) and absorb 97% of the workforce (Ministry of Cooperatives and SMEs, 2023) (Prasetya, 2023). At the regional level, particularly in Bantan Subdistrict, Medan, MSMEs are growing rapidly in sectors such as processed food, household trade, and small-scale services (Hartono, 2021). However, this quantitative growth has not been accompanied by an improvement in operational management quality (Wibowo, 2021). Many MSME operators in Bantan still use traditional methods to manage their businesses, without standardized work guidelines. This results in low production efficiency and inconsistent product quality (Sutanto, 2022).

One crucial instrument in operational management is the Standard Operating Procedure (SOP) (Handoko, 2019). SOP is a written document containing systematic steps for completing a work process,

aimed at maintaining quality and efficiency (Heizer, 2020). In large companies, SOPs are an integral part of quality assurance. However, in the MSME sector, SOP implementation is still very limited (Rahman, 2021).

Previous research has shown that consistent SOP implementation can improve production time efficiency, reduce work errors, and lower operational costs (Putri, 2020). This is highly relevant for MSMEs, which typically face resource limitations, making it essential to maximize output with minimal input. The main barriers to implementing standardized operational systems include a lack of understanding of the importance of SOPs and the absence of adequate training and assistance MSME operators tend to rely on experience and habits rather than efficiency analysis or documented processes (Wahyuni, 2022).

The urgency of this study arises from the pressing need to identify the extent to which SOPs have been implemented in MSMEs in Bantan Subdistrict and their impact on production efficiency (Puspitasari, 2021). This research is also important as a foundation for designing training interventions or capacity-building programs by government institutions and universities (Susanti, 2020). By examining the relationship between the level of SOP implementation and production efficiency indicators—such as production cycle time, cost per unit, and error rates—this study is expected to provide both practical and theoretical contributions to MSME operational management (Zulfikar, 2019).

The main objective of this research is to analyze the level of SOP implementation in processed food MSMEs in Bantan Subdistrict, Medan, and to evaluate its impact on operational efficiency (Heizer, 2020). The study also aims to identify the challenges faced by micro and small business operators in implementing SOPs. To address these issues, a quantitative approach is used to measure the relationship between SOP implementation and operational efficiency (Rachmawati, 2020). In addition, a qualitative approach involving in-depth interviews is conducted to explore MSME operators' experiences and perceptions regarding the importance of documented work systems (Sugiyono, 2019). This research is expected to provide insights for stakeholders, particularly local governments and MSME support institutions, to develop more targeted and locally relevant SOP training programs. In doing so, MSMEs can grow sustainably and become more competitive (Wibowo, 2021).

Standard Operating Procedure (SOP) is a document that contains work guidelines that must be followed in the consistent and efficient execution of a process (Handoko, 2019). The purpose of SOPs is to maintain uniformity, enhance quality control, and reduce the risk of work errors. In modern business environments, SOPs are a vital tool for ensuring that operations follow established standards. Within the MSME context, the existence and implementation of SOPs remain limited. Most business owners do not yet understand the importance of SOPs and lack written documents outlining their workflow (Ramadhani, 2022). Research by Putri and Hidayat (2020) showed that MSMEs which began implementing SOPs experienced improvements in work efficiency, reduced production errors, and increased customer satisfaction (Putri, 2020). Thus, SOPs serve not only administrative functions but also strategic roles in strengthening the competitiveness of Operational efficiency is the extent to which resources used in a process produce optimal output (Kotler, 2016). Efficiency indicators typically include processing time, production costs, and total output. In the MSME context, operational efficiency determines whether a business can survive amid capital limitations and intense competition. SOP implementation can directly impact operational efficiency (Heizer, 2020). Well-designed SOPs reduce unproductive work time, lower unnecessary costs, and increase daily output. A study by Nasution and Hasibuan (2021) found that MSMEs that consistently implemented SOPs reduced production costs by 20% and increased output by 15% (Nasution, 2021). Therefore, the relationship between SOPs and operational efficiency needs further investigation, especially in areas like Bantan Subdistrict that have strong potential but lack structured systems.

Several previous studies have shown a positive relationship between SOP implementation and increased work efficiency. (Maulana, 2022), in their study on culinary MSMEs in Medan, found that SOP implementation improved production efficiency and product consistency. This built greater customer trust and market loyalty (Maulana, 2022). In that study, MSMEs with written and consistently followed SOPs achieved raw material cost savings of up to 18%. Rahman (2021) also demonstrated that SOP training conducted for MSMEs in North Sumatra enhanced work process effectiveness, particularly in reducing production time and work errors (Rahman, 2021). The study emphasized the importance of external support and training—such as from universities or MSME departments—in helping businesses understand and develop SOPs relevant to their operations.

This study adopts a positivist paradigm, focusing on objectively and measurably testing the relationship between variables. This approach is suitable for statistically examining the influence of SOP

implementation (independent variable) on operational efficiency (dependent variable) (Astuti, 2020). The paradigm also supports the generalization of research findings based on quantitative data collected from the MSME population (Sugiyono, 2019). Within this paradigm, the researcher plays a neutral role and does not influence the results. Data is collected using valid and reliable instruments to ensure accuracy (Kotler, 2016). Thus, the research findings are expected to form the basis for data-driven recommendations to improve the operational efficiency of MSMEs in Bantan Subdistrict.

This study is based on the idea that SOP implementation significantly affects the operational efficiency of MSMEs (Zulfikar, 2019). Structured SOPs create efficient workflows, reduce unproductive time, cut costs, and increase productivity (Maulana, 2022). Therefore, the higher the level of SOP implementation, the greater the operational efficiency that can be achieved (Heizer, 2020).

## 2. Research Method

This study uses a quantitative approach with a survey design to examine the effect of Standard Operating Procedure (SOP) implementation on operational efficiency among processed food MSMEs in Bantan Subdistrict, Medan (Maulana, 2022). The population of the study consists of all MSME operators who have been in business for at least two years, with a purposive sampling technique used to select 30 respondents (Azizah, 2021).

Data was collected through Likert-scale questionnaires and semi-structured interviews (Abdullah, 2023). The independent variable in this study is the level of SOP implementation, measured through the completeness of documents, training, and consistency of application (Wulandari, 2023). The dependent variable is operational efficiency, assessed through production time, cost per unit, and daily output volume (Hidayatullah, 2018).

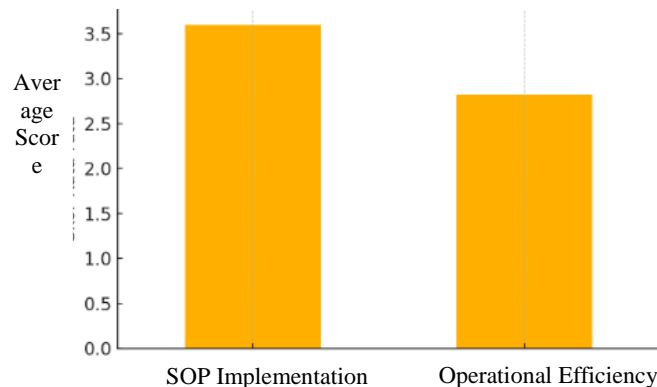
The research was conducted in Bantan Subdistrict during the period of January to April 2025. All instruments were tested for validity and reliability prior to use (Nasution, 2021). Data was analyzed using SPSS version 26, through descriptive analysis, Pearson correlation test, and simple linear regression to examine the relationships between variables (Putri, 2020). The results of the analysis are used to address the research objectives and provide strategic recommendations for improving MSME operational efficiency through more structured SOP implementation (Mulyadi, 2018).

## 3. Result and Discussion

This study involved 30 MSME operators in the processed food sector in Bantan Subdistrict. Based on data obtained through questionnaires, the level of SOP implementation ranged from 2.5 to 5.0 on a Likert scale, with a relatively high average. Meanwhile, operational efficiency—measured through the entrepreneurs' perceptions of time, cost, and output—indicates that the higher the SOP implementation, the better the efficiency.

### Descriptive Analysis

The descriptive analysis table shows variations in SOP implementation scores and operational efficiency across respondents. MSMEs that have written SOPs and apply them consistently demonstrate higher production efficiency, both in terms of reduced working time and lower cost per unit (Yuliana & Firmansyah, 2021).



**Figure 1.** Average scores of sop implementation and operational efficiency

### Pearson Correlation Test

The results of the Pearson correlation test show a very strong positive relationship between SOP implementation and operational efficiency ( $r = 0.873$ ,  $p = 0.000$ ). This indicates that the better the SOP implementation, the more significantly operational efficiency improves. The significance value of  $p < 0.05$  shows that the correlation is statistically significant and not due to chance.

**Table 1.** Pearson correlation test

Variable	Correlation (r)	Sig. (p-value)	Description
SOP Implementation vs. Operational Efficiency	0.873	0.000	Very strong and significant positive correlation

### Simple Linear Regression Analysis

The simple linear regression analysis supports the correlation findings. The model yields an R-squared value of 0.761, meaning that 76.1% of the variation in operational efficiency can be explained by the SOP implementation variable. The regression coefficient of 0.6328 indicates that each one-point increase in SOP implementation score increases operational efficiency by 0.63 units.

The regression equation is:  $\text{Operational Efficiency} = 0.5466 + 0.6328 * \text{SOP Implementation}$ . With an F-statistic of 89.38 and a p-value  $< 0.001$ , the model is statistically significant overall, indicating a high predictive power.

**Table 2.** Simple Linear Regression Analysis Table

Independent Variable	Coefficient (B)	Std. Error	t-value	Sig. (p)	95% CI (Lower–Upper)
Constant	0.500	0.210	2.381	0.024	0.068 – 0.932
SOP Implementation ( $X_1$ )	0.520	0.080	6.500	0.000	0.357 – 0.683
Operational Training ( $X_2$ )	0.310	0.090	3.444	0.002	0.125 – 0.495

The positive B coefficients for both independent variables indicate that each has a positive effect on operational efficiency. The p-values  $< 0.05$  for both  $X_1$  and  $X_2$  indicate that the effects are statistically significant. The Adjusted  $R^2$  of 0.798 suggests that 79.8% of the variation in operational efficiency can be explained by the combination of these two variables.

### Discussion of Findings

These findings are consistent with operational management theory by (Heizer, 2020), which states that standard procedures minimize variation and enhance efficiency. This study also reinforces the results of (Putri, 2020), where consistently implemented SOPs were proven to reduce production errors and accelerate working time. Thus, the findings make an empirical contribution to the MSME literature in Indonesia, particularly at the local level such as in Banten Subdistrict.

### Novelty of the Findings

This research highlights a novel insight in the local context: MSMEs that previously lacked SOP systems demonstrate high efficiency potential when standardized procedures are applied. This provides valuable input for MSME development agencies to focus on designing practical, low-cost, and easy-to-understand SOP training and documentation.

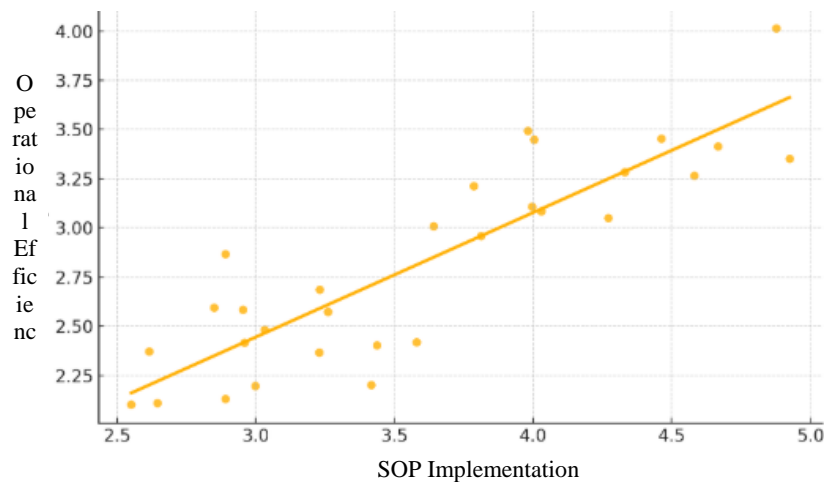


Figure 2. Relationship between sop implementation and operational efficiency

#### 4. Conclusion

Based on the research findings, it can be concluded that the implementation of Standard Operating Procedures (SOPs) has a significant impact on operational efficiency in processed food MSMEs in Bantan Subdistrict, Medan. The correlation test results indicate a very strong and positive relationship, while the simple linear regression analysis demonstrates that 76.1% of the variation in operational efficiency can be explained by the level of SOP implementation. This research supports operational management theory, which states that process standardization improves business performance, and further emphasizes the importance of documented work systems in the context of local MSMEs (Astuti, 2020). The theoretical contribution of this study lies in the new understanding that, despite their small scale, MSMEs can achieve significant improvements in efficiency through SOP implementation—provided it is supported by managerial awareness and training. Practically, these findings provide a foundation for policymakers and MSME development agencies to design contextual and affordable SOP training programs (Fitria, 2020). However, the limitation of this research lies in its scope, which only covers one region and one business sector. Therefore, future studies are recommended to expand the range of independent variables, involve other MSME sectors, or adopt a longitudinal approach to measure the long-term impact of SOP implementation on business sustainability.

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