

Readiness for Total Quality Management Implementation and Its Association with Product Quality and Production Efficiency: A Case Study of Raja Rasa Traditional Snack MSME

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ABSTRACT

This study aims to assess the readiness for the implementation of Total Quality Management (TQM) and explore its relationship with product quality and production efficiency in a micro, small and medium enterprise (MSME) producing snacks through a single case study approach, which has limitations in terms of generalization. The respondents involved were owners and employees ($n = 4$) who were selected purposively. TQM readiness was measured using an instrument based on five dimensions, namely customer focus, continuous improvement, employee involvement, leadership, and process management, which were adapted from the TQM conceptual framework and measured using a 1–5 Likert scale. The readiness index was calculated using a simple unweighted average, with the following categories: 1.0–2.0 (not ready), 2.1–3.0 (not very ready), 3.1–4.0 (quite ready), and 4.1–5.0 (ready). Product quality and production efficiency were evaluated based on respondents' views, supported by direct observation of the production process to reduce bias in internal reports. This analysis was performed using descriptive and Spearman's rank correlation statistics. The findings of this study show that the readiness index is 4.00, product quality is 3.66, and production efficiency is 3.16. The identified relationship shows a positive connection between TQM readiness and product quality ($\rho = 0.632$) and production efficiency ($\rho = 0.775$). Pareto analysis found three main factors causing production problems—raw material instability (30%), lack of Standard Operating Procedures (SOP) (16.67%), and defective products (13.33%)—which contributed to 60% of total incidents. The results of this study provide a readiness profile and identify priority gaps in process management, emphasizing the importance of implementing operational standards to improve production efficiency.

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1. Introduction

Micro, Small, and Medium-Sized Enterprises (MSMEs) are a vital pillar of the Indonesian national economy, as they play a key role in creating jobs, increasing community income, and strengthening the local economy (Fuadi *et al.*, 2021). In addition, MSMEs demonstrate considerable resilience in the face of economic crises and serve as stabilizers at the global level. MSMEs can create added value by optimally utilizing resources across various fields,

such as agriculture, fisheries, trade, and manufacturing (Sarfiyah *et al.*, 2019).

Based on data from the Ministry of Kementrian Koperasi dan UKM (2024), the number of MSMEs in Indonesia registered in 38 provinces as of December 31, 2024, reached 30,178,617 business units, outside the Indonesian Standard Industrial Classification (KBLI) A, O, T, and U, which cover the agriculture, government, self-consumption services, and international agencies sectors. Most of these business units are micro businesses that dominate the national MSME structure. If this figure is combined with data from the Central Badan Pusat Statistik (2023), which recorded around 29.3 million micro and small business units in the agriculture and fisheries sectors, the total number of business units in Indonesia is approximately 59.5 million. The integration of this data aims to provide a comprehensive picture of all business units in Indonesia by combining the agricultural and non-agricultural sectors to create an accurate national database. This large number underscores the significant scale of MSMEs in the national economy and reflects the high level of competition that demands continuous improvement in management quality and business efficiency.

In the face of these competitive dynamics, every business actor needs to analyze and evaluate their business development plans. This evaluation is important for determining realistic development strategies aligned with the business's internal capacity business (Uhrowiyah *et al.*, 2021). Although the number of MSMEs continues to increase, this growth has not been fully matched by improvements in business management. In practice, every business faces various obstacles, whether technical, managerial, or market-related, which can hinder operational effectiveness and business growth (Heryadi *et al.*, 2021). MSMEs still face several problems, including inadequate use of technology, suboptimal product distribution, and unstructured management systems.

In daily operations, common problems include the absence of standard operating procedures (SOPs), fluctuations in product quality, and inefficiency in the production process. These problems are often found in MSMEs that implement a restocking or inventory-based production system. Operationally, the restocking system refers to a production-to-stock pattern in which production is initiated when inventory levels decline and halted when stock is still available (Salsabiela *et al.*, 2024). This production pattern has the potential to lead to variations across production batches, increase the frequency of process adjustments, and introduce inconsistencies in quality control if it is not supported by operational standards and a structured quality control system (Wahyudin *et al.*, 2025). Variability in raw material inputs and repeated production process adjustments can lead to fluctuations in product quality and reduce operational efficiency. In addition, without consistent quality management and production processes, a product's added value can be reduced by inefficiencies and quality inconsistencies (Pamujiati *et al.*, 2020).

This condition is reflected in the Raja Rasa Tradisional Snack MSME in Bojonegoro, which produces a range of snacks, including banana chips, breadfruit chips, and gadung chips. Despite having a distribution network that covers traditional markets, supermarkets, and online platforms, this business still faces challenges maintaining consistent product quality and efficient production. This indicates the need for a more structured and sustainable approach to quality management. This condition underscores the need for a more flexible yet structured management strategy to enable business owners to survive and thrive in an increasingly competitive market (Kurniawan *et al.*, 2022).

Total Quality Management (TQM) is a management system that emphasizes customer satisfaction through continuous improvement of products, services, and processes, with high-

quality standards (Aziz, 2019). Idris & Nurnajamuddin, (2023) explain that TQM is an integrated system in business management that emphasizes quality across all operational aspects. TQM can be an alternative approach to addressing increasingly complex and dynamic business challenges and requires the commitment of all parties in the organization (Putra *et al.*, 2024).

Several studies show that implementing TQM can improve business performance. For example, research by Dasmasele *et al.*, (2020) demonstrates that implementing TQM can improve a company's quality, performance, efficiency, and profitability. Another study by Zahrah *et al.*, (2022) found that changes in TQM implementation affect a company's overall performance. Gea *et al.*, (2024) also note that TQM has a positive impact on improving product quality. In addition, Hasani, (2025) states that the effective implementation of TQM can improve product quality and competitiveness.

However, most studies on Total Quality Management (TQM) still focus on the impact after implementation, while studies on organizational readiness prior to implementation are relatively limited. In fact, organizational readiness is a key factor in determining the success of management system changes. The concept of organizational readiness for change emphasizes that resources, commitment, and a vision for change are prerequisites for effective implementation (Haludin *et al.*, 2022). In addition, internal factors such as leadership, employee participation, and consistent process management also play an important role in the successful implementation of TQM (Arief & Any Setianingrum, 2023). Thus, evaluating readiness is a strategic step to minimize the risk of failure and ensure the sustainability of TQM implementation.

In this study, TQM implementation readiness is measured across five main dimensions: Customer Focus, Continuous Improvement, Employee Involvement, Leadership and Commitment, and Process Management (kadafi *et al.*, 2024). These five dimensions represent the core elements of quality management practices, namely customer orientation, continuous improvement, human resource participation, strong leadership, and systematic process management.

Given this background, the purpose of this study is to:

1. assess the readiness level of Raja Rasa Tradisional Snack MSME in implementing Total Quality Management;
2. analyze the relationship between TQM implementation readiness and product quality; and
3. analyze the relationship between TQM implementation readiness and production efficiency.

From a managerial perspective, this study contributes to helping SME actors prioritize process management improvements as an initial stage before full TQM implementation..

2. Methodology

2.1 Research Design

This study used a descriptive quantitative case study design with a qualitative triangulation approach. Case studies were chosen because the research focused on a single business unit with a specific context, aiming to gain an in-depth understanding of the phenomenon under study (Yin, 2018). A quantitative approach was used to systematically assess the level of readiness for Total Quality Management (TQM) implementation using

structured instruments. The qualitative approach through observation was used to increase the credibility of the findings (Creswell, 2014) Given the very limited number of respondents ($n = 4$), the study did not aim to make statistical generalizations but rather to provide a contextual description of the organization's internal readiness.

2.2 Conceptual Model and Research Procedures

The conceptual model of the study places TQM Implementation Readiness as an independent variable (X) related to Product Quality (Y1) and Production Efficiency (Y2). The independent variable is explicitly defined as implementation readiness, not full TQM implementation. TQM implementation readiness is measured based on five main dimensions that are widely referenced in quality management literature, namely customer focus, continuous improvement, employee involvement, leadership and commitment, and process management (Goetsch, 2016; Oakland, 2014).

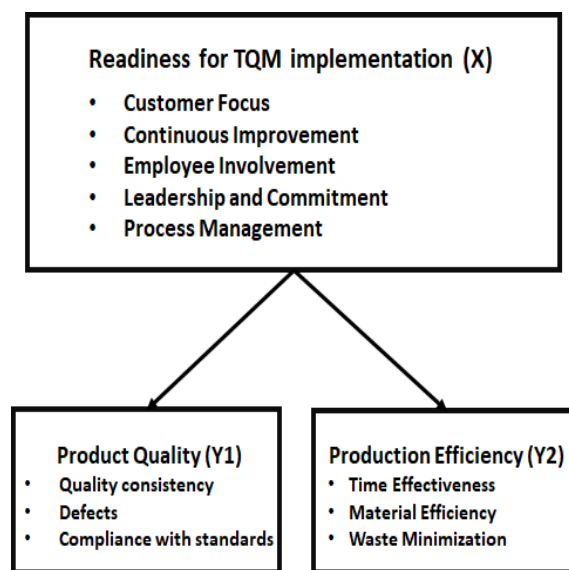


Figure 1. Conceptual Model Framework

2.3 Research Location and Subject

The research was conducted at Raja Rasa Tradisional Snack MSME located in Sumodikaran Village. The location was selected purposively based on contextual relevance and organizational readiness for research (Sugiyono, 2021). The research subjects consisted of all internal parties involved in business management and the production process, namely one owner and three employees. The sampling technique used was total sampling, as the entire population served as respondents (Sugiyono, 2021). With a limited number of respondents, the research results are contextual and are not intended for broad population inference.

2.4 Variables and Operationalization

The independent variable in this study is TQM Implementation Readiness (X), which is operationalized based on five main dimensions as described in TQM theory (Goetsch, 2016; Oakland, 2014). The dependent variables consist of Product Quality (Y1) and Production Efficiency (Y2). Each dimension is measured using three statements, resulting in a total of

twenty-one items. Because both dependent variables are measured based on perception, this study acknowledges the potential for common method bias.

Table 1. Variable Indicators

Variable	Dimension / Indicator	Number of Items	Scale	Source / Adaptation	Notes
X: TQM Implementation Readiness	Customer Focus	3	1–5	Goetsch (2016), Oakland (2014)	Respondent perception
	Continuous Improvement	3	1–5		Respondent perception
	Employee Involvement	3	1–5		Respondent perception
	Leadership & Commitment	3	1–5		Respondent perception
	Process Management	3	1–5		Respondent perception
Y1: Product Quality	Quality consistency, defects, standard compliance	3	1–5	Internal adaptation	Respondent perception
Y2: Production Efficiency	Time effectiveness, material efficiency, waste minimization	3	1–5	Internal adaptation	Respondent perception

2.5 Instruments and Assessment

In this study, a five-point Likert scale was used as the measurement tool, with response options ranging from “strongly disagree” to “strongly agree”. The validity of the instruments was assessed using the content validity approach, which involved aligning each item with the theoretical TQM construct used as the basis for instrument development (Sekaran, 2016). Each item was developed to represent the conceptual indicators of each dimension, ensuring consistency between the theory and the measurement tools.

Instrument reliability was measured using Cronbach’s alpha to assess the internal consistency of items within a single construct (Ghozali, 2021). An alpha value ≥ 0.70 was interpreted as adequate reliability. However, the reliability results were interpreted with caution, given the very limited number of respondents, which could affect the stability of the coefficient.

2.6 Data Collection Techniques

Research data was obtained through closed questionnaires distributed to all respondents and direct observation of the MSME production process. This approach was used as a form of triangulation to increase the validity of the findings (Creswell, 2014). It should be noted that the MSME studied did not have internal documentation in the form of systematic records of production, raw material usage, or product defect rates. This condition was a structural limitation acknowledged in the study, so data analysis was entirely dependent on direct observation and respondent perceptions.

2.7 Data Analysis Techniques

Data analysis begins with descriptive analysis to describe the average scores for each dimension and variable. Next, the TQM implementation readiness index is calculated as the overall average across all dimensions, without specific weighting, as the five dimensions are considered to have equal conceptual contributions (Goetsch, 2016). The readiness categories are determined by dividing the Likert scale into four equal categories.

Table 2. Likert Scale Intervals for Dependent Variables

Average Score	Category
1.0 – 2.0	Not Ready/Good
2.1 – 3.0	Less Ready/Good
3.1 – 4.0	Sufficiently Ready/Good
4.1 – 5.0	Ready/Good

The relationship between TQM implementation readiness and product quality and production efficiency were analyzed using Spearman Rank correlation. This method was chosen because the data was ordinal and the number of respondents was small, so it did not require the assumption of normality as in parametric tests. Correlation interpretation was based on the direction and strength of the relationship without claiming statistical generalization.

To enrich the interpretation, Pareto analysis was used to determine improvement priorities, as well as fishbone analysis, which serves to identify the main sources of production problems by considering human factors, methods, materials, machinery, and the environment.

2.8 Research Ethics and Limitations

All respondents provided consent to participate in this study. Given the small number of respondents, the data could identify individuals; therefore, it is presented in aggregate form and does not contain any personal information. The principles of confidentiality and research ethics were maintained in accordance with social research standards (Creswell, 2014). This study has limitations related to its small sample size, the lack of internal documentation, and the use of a dependent variable based on perceptions; therefore, the findings are contextual and not intended for broad generalization.

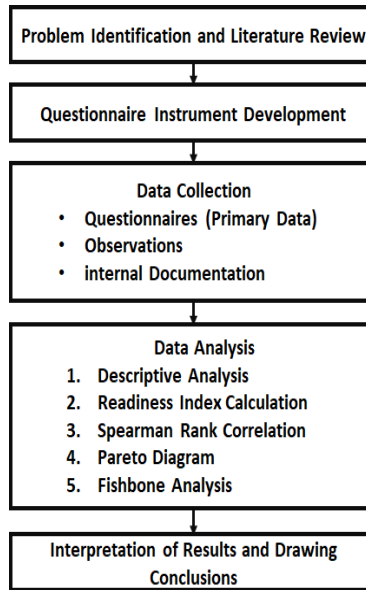


Figure 2. Conceptual Framework

3. Results and Discussion

3.1. Research Results

3.1.1 *Conceptual Model*

This study used a conceptual model in which Total Quality Management (TQM) readiness is an independent variable (X) and product quality (Y1) and production efficiency (Y2) are dependent variables. This model is designed to examine the relationship between readiness to implement quality management principles and operational performance in the MSME studied, without conflating the procedural stages of research with the conceptual framework.

In theory, the correlation between these variables is positive, indicating that the higher the level of TQM readiness, the better the product quality and production efficiency achieved. This correlation assumes that applying quality management principles—such as customer orientation, continuous improvement, and process management—improves quality and operational performance.

3.1.2 *Instrument Reliability Test*

Reliability was tested using Cronbach’s alpha to evaluate the internal consistency of each construct. The results of the testing are presented in Table 3.

Table 3. Reliability Test Results

Variable	Number of Items	Cronbach’s Alpha	Description
TQM Implementation Readiness	15	0,875	Reliable
Product Quality	3	0,875	Reliable
Production Efficiency	3	0,889	Reliable

Source: Processed primary data, (2025)

All variables showed Cronbach's Alpha values above 0.70, indicating good internal consistency. The relatively high alpha values in constructs with a limited number of items

(three items) indicate the homogeneity of respondents' answers. However, the interpretation of reliability results is cautious given the very small sample size ($n = 4$), which may affect the stability of coefficient estimates and increase the risk of overestimating reliability.

3.1.3 Descriptive Statistic

Descriptive analysis was conducted to determine the trends in the scores for each variable. The results are presented in Table 4.

Table 4. Descriptive Statistics

Variable	Mean	Category
TQM Implementation Readiness	4,00	Fairly Ready
Product Quality	3,66	Fairly Good
Production Efficiency	3,16	Fairly Good

Source: Processed primary data, (2025)

The average TQM readiness score of 4.00 indicates that the organization is fairly ready to implement quality management principles. Product quality scored 3.66, indicating a fairly good condition, while production efficiency scored 3.16, also in the fairly good category. These results show that the application of quality principles has been running at an adequate level, but there is still room for improvement to achieve a more optimal level of readiness and performance.

3.1.4 TQM Implementation Readiness Index

The readiness index is calculated using the unweighted average of all TQM dimensions. This approach is used because these five dimensions—customer focus, continuous improvement, employee engagement, leadership and commitment, and process management—are considered to make equal conceptual contributions to representing overall quality management readiness.

An index value of 4.00 places MSME in the fairly ready category based on the predetermined interval (3.1–4.0). This result indicates that the organization has an adequate foundation for implementing quality management principles. However, there is still room for improvement in several dimensions to achieve a more optimal level of readiness.

3.1.5 Spearman Correlation

The relationship between variables was analyzed using Spearman's rank correlation because the data were ordinal and the sample size was limited. The test results are presented in Table 5.

Table 5. Spearman Correlation Results

Relationship	Coefficient (ρ)	Sig
TQM – Product Quality	0.632	0.368
TQM – Production Efficiency	0.775	0.225

Source: Processed primary data, (2025)

The analysis indicates that TQM readiness is positively related to product quality ($\rho = 0.632$) and production efficiency ($\rho = 0.775$). Based on the correlation coefficient interpretation criteria, these values are in the strong relationship category. The relationship between TQM readiness and production efficiency is stronger than that with product quality.

The significance value is above 0.05, but given the very small sample size, the interpretation focuses on the direction and strength of the relationship in context, rather than

on inferential significance testing. These findings indicate that greater quality management readiness tends to be associated with higher quality and production efficiency in the MSME studied.

3.1.6 Problem Identification Using Pareto Charts

Based on direct observation of the production process, 30 problems were identified and grouped into seven contributing factors. The Pareto analysis results in Figure 3 show that the three dominant factors are raw material instability (30%), lack of written standard operating procedures (SOPs) (16.67%), and product defects (13.33%).

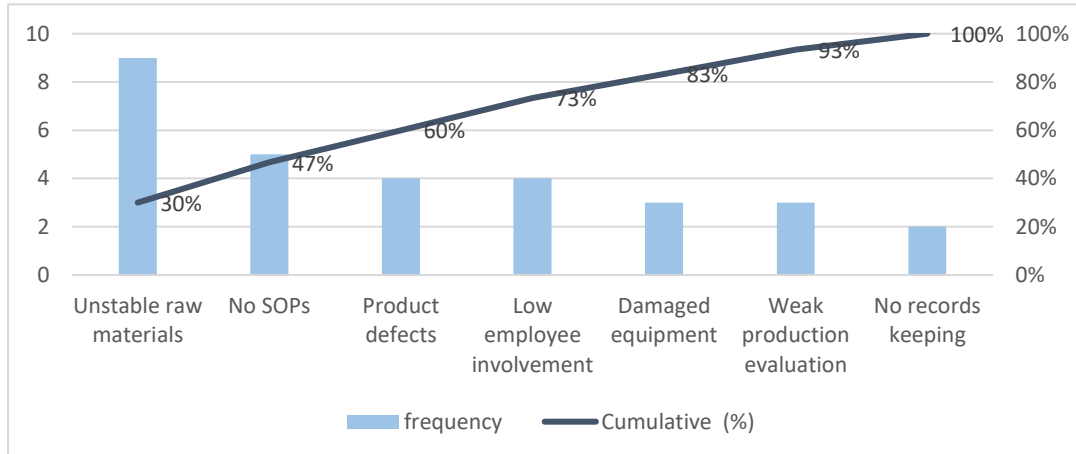


Figure 5. Pareto Chart of Production Problems
 Source: Processed primary data, (2025)

These three factors cumulatively account for 60% of total incidents, making them a top priority for improvement in accordance with the Pareto principle. The dominance of problems in the raw materials area and the absence of SOPs indicate that process management and operational standardization are not yet optimal. In contrast, the emergence of product defects indicates weak quality control during production. These findings are consistent with the readiness index results, which place the organization in the moderately ready category, particularly in process management and quality control.

3.1.7 Root Cause Analysis Using Fishbone Diagrams

Fishbone diagrams (Ishikawa diagrams) are used to systematically and comprehensively examine and assess cause-and-effect relationships in production processes. This method was chosen because it can visually and structurally identify the causes of problems, making it easier to identify the factors contributing to the problem. The analysis was conducted systematically on three main problems identified in a Pareto chart: unstable raw materials, lack of SOPs, and product defects. The purpose of this analysis was to obtain a more specific, focused, and in-depth mapping of the causes by problem characteristics, so that the resulting recommendations for improvement could be more accurate.

1. Fishbone Analysis of Unstable Raw Materials

The results of the fishbone analysis show that several key factors, such as Man, Method, and Material, affect the stability of raw material issues.

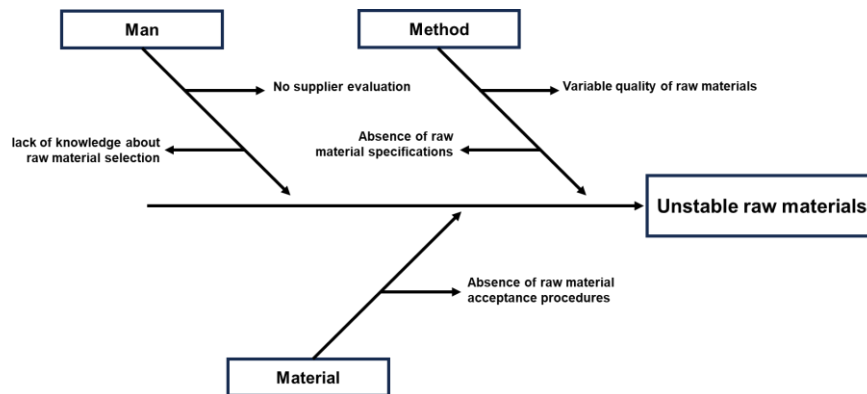


Figure 6. Fishbone Diagram of Unstable Raw Materials

Based on Figure 6, there is a problem with the Man factor due to employees' lack of knowledge and skills in selecting raw materials that meet expected quality standards. The raw material acceptance process still involves subjective assessment without strict criteria, leading to variations in product quality. From the method factor, problems arise due to the lack of raw material specification standards and acceptance procedures.

The lack of information about the characteristics of the raw materials used leads to inconsistent selection. On the other hand, in the Material factor, reliance on multiple suppliers without regular quality evaluations makes it difficult to control variations in raw material quality. The combination of problems across these three factors causes weak raw material stability and negatively impacts product quality, which varies.

2. Fishbone Analysis of Unstable Raw Materials

The results of the fishbone analysis of the absence of standard operating procedures (SOPs) indicate that Man and Method are the main causes. From the Man aspect, the understanding of employees and business owners of the importance of SOPs as work practices has led to production activities being carried out based on individual preferences and experiences. This situation has created inconsistent work standards among employees that are difficult to control.

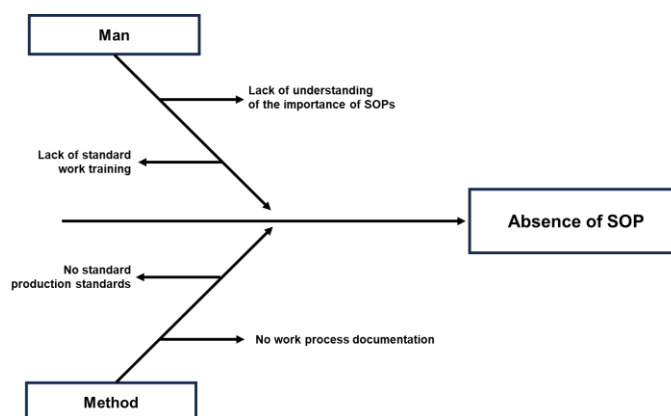


Figure 7. Fishbone Diagram of the Causes of the Absence of SOPs

In terms of Method, the lack of standardized work process documentation is the root cause of the problem. Each stage of production, from material preparation to processing and packaging, lacks clear written procedures. As a result, the production process becomes

informal and unstructured, leading to errors, inefficiencies, and variable production results. The absence of SOPs also hinders systematic evaluation and monitoring of production performance.

3. Fishbone Analysis of Product Defects

The results of the fishbone analysis of product defects indicate that the causes are more complex and involve several aspects, including Man, Machine, Method, and Material. From the Man aspect, the lack of employee accuracy and attention to product quality during the production process resulted in products that were not as good as they should have been. In addition, employees also lacked understanding of the product standards that must be met.

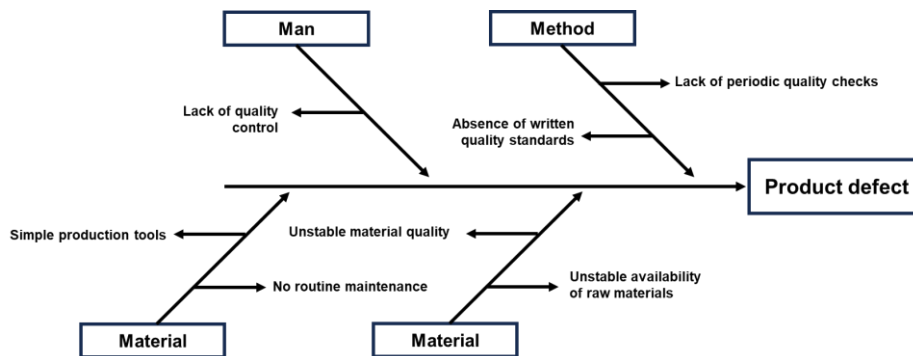


Figure 8. Fishbone Diagram of Product Defect Causes

In terms of Machinery, the use of simple production methods and the lack of a routine maintenance schedule resulted in suboptimal equipment performance and potentially increased production inconsistencies. In terms of Method, the absence of quality standards and quality control procedures results in defective products being sent to the packaging stage without repair. On the other hand, in terms of Material, the use of unstable raw materials increases the possibility of product defects. The interaction between these aspects makes the product a complex problem that requires comprehensive attention and handling.

4. Recommendations for Improvement Based on Fishbone Analysis Results

A Fishbone diagram is generally a visual representation that shows the causes of failure or nonconformity, to analyze the root causes of problem (Aristriyana & Fauzi, 2022). Overall, the fishbone analysis results show that each problem faced has different but interrelated causes, so they cannot be solved with a single universal solution. The problem of unstable raw materials requires supplier oversight and standardization of raw materials, while the absence of SOPs underscores the importance of developing work systems and production process documentation. On the other hand, product defects require comprehensive quality control improvements that cover Man, Machine, Method, and Material resources. This shows that SOPs, raw material control, and strengthening the quality control system are strategic tools that form the basis for quality management to be applied to Raja Rasa Tradisional Snack MSME.

3.2 Discussion

This study is a case study of one MSME with a limited number of respondents. Therefore, the study's results are contextual and not intended for statistical generalization. The level of readiness for TQM implementation, in the ready category, indicates that,

perceptually, management and employees already understand quality principles. The dimensions of leadership and customer orientation are relatively strong, reflecting managerial commitment to product quality.

However, the Pareto and fishbone results show that the main weaknesses lie in process standardization and raw material control. The absence of written SOPs and a production recording system indicates that the principles of continuous improvement and process management have not been fully internalized. The strong relationship between TQM implementation readiness and product quality indicates that organizational readiness contributes to consistent quality. Meanwhile, the moderate relationship with production efficiency suggests that quality improvements have not yet fully optimized time and resource utilization.

This study also acknowledges the potential for general-method bias, as the dependent variables are measured based on respondents' perceptions. In addition, the very small sample size may affect the stability of the correlation coefficient and reliability. Overall, the readiness for TQM implementation in the MSME studied is conceptually adequate but still requires strengthening operational systems, particularly in the preparation of SOPs, control of raw materials, and production recording systems, as part of sustainable quality management practices.

4. Conclusion

This study shows that the MSMEs studied are at a fairly advanced level of TQM implementation, with an index of 4.00. Product quality and production efficiency are both in the fairly good category. Spearman's correlation analysis shows a positive relationship between TQM readiness and product quality ($\rho = 0.632$) and production efficiency ($\rho = 0.775$), suggesting that increased managerial readiness can improve operational performance. Pareto analysis identified three main problems that contributed to 60% of production incidents: instability of raw materials, lack of written SOPs, and product defects. These findings indicate that strengthening process standardization and raw material quality control should be a priority for managerial intervention. Given that this is a single-case study with a limited number of respondents, the results should be interpreted with caution and not generalized broadly. Further research involving more MSMEs and using objective performance indicators is recommended to improve external validity.

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