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Six Sigma-Based Quality Management Strategy to Enhance the Competitiveness of Food Souvenir MSMEs in East Kalimantan

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ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) plays an important role in the Indonesian economy. MSMEs contribute around 60% to the Gross Domestic Product (GDP) and absorb more than 97% of the workforce. The culinary sector, especially local specialty culinary products, is one of the fastest-growing sectors and has great potential to boost the local economy, including in East Kalimantan. However, this potential is not fully realized because many MSMEs still face issues with product quality. This condition reduces MSMEs' market competitiveness. This research aims to develop a strategy to improve MSME quality by prioritizing key areas. The method used is Six Sigma, with the stages of Define, Measure, Analyze, Improve, and Control (DMAIC), combined with Importance-Performance Analysis (IPA). Data collection is conducted through a customer satisfaction questionnaire, which is then analyzed using Six Sigma methods to determine performance levels. The findings indicate that the sigma level of food souvenir MSMEs in East Kalimantan is 2.435. This figure suggests that the process capability in meeting customer expectations remains low. The Importance-Performance Analysis (IPA) identified three priority attributes for improvement: staff appearance, communication with customers, and the provision of product testers. The proposed improvement recommendations are complemented by Key Performance Indicators (KPIs) to ensure the sustainability of quality enhancement efforts. The novelty of this study lies in applying the Six Sigma method to small-scale culinary MSMEs through a multidimensional approach that integrates product quality, service quality, pricing, and customer experience within the context of a developing region. In practice, this study contributes to offer measurable improvement priorities for MSME practitioners, thereby supporting the enhancement of MSME competitiveness at both the local and national levels.

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1. Introduction

MSMEs play a crucial role as a major support for the Indonesian economy. With a contribution of around 60% to the Gross Domestic Product (GDP) and labor absorption of more than 97%, MSMEs are among the largest contributors to national economic development (Nugraheni et al., 2026). One of the MSME sectors that is rapidly developing is culinary, including local specialty products as souvenirs (Caswati et al., 2024; Febrianasari et al., 2024).

In East Kalimantan, food MSMEs, especially local specialty products sold as souvenirs, have great potential to support local economic development (Rahaya, 2025). It has been inseparable from the many typical culinary products that have unique attractions for tourists and the local community (Christian et al., 2015). Despite its great potential, many MSMEs in this region that offer local specialty products as souvenirs are still facing various challenges that hinder their development. The main problem is that few MSMEs have planned quality management (Quintin, 2025; Stiyoaji et al., 2024), making it difficult for them to compete in an increasingly competitive market. In addition, the limited understanding of modern quality management leads business actors to rely on traditional methods that are less effective at maintaining overall quality.

Another problem, no less important, is operational inefficiency. Many MSMEs conduct production processes without clear standards, resulting in a high number of product defects (Moektiwibowo et al., 2024; Nur et al., 2024). MSMEs often deliver inconsistent service quality, set uncompetitive product prices, and fail to manage customer satisfaction effectively. Limited capital, inadequate technology, and insufficiently trained labor further exacerbate these conditions (Ali et al., 2023; Quintin, 2025; Setyaningsih & Kelle, 2022). Given these conditions, improving the quality of food souvenir MSMEs in East Kalimantan has become an urgent necessity. The Six Sigma method offers a viable solution by enabling the identification of root causes and the design of data-driven improvements. The DMAIC (Define, Measure, Analyze, Improve, Control) approach in Six Sigma systematically enhances process quality, and organizations can adapt it for MSMEs despite their resource limitations (Corredor-Rojas et al., 2025). To determine which attribute, require the most urgent improvement, Importance-Performance Analysis (IPA) is used to map the importance and performance levels of each service attribute. Through this approach, improvement priorities can be clearly established based on customer perceptions (Wu et al., 2023).

Numerous studies have examined the application of the Six Sigma method across various large-scale sectors, including manufacturing (Mittal et al., 2023; Patel & Chaudhari, 2024; Widiwati et al., 2024), oil and gas (Esmaili et al., 2024; Kholil, 2023), and service industries (Dwijayanti & Fani, 2022). These studies demonstrate that Six Sigma is effective in reducing product defects, improving operational efficiency, and enhancing customer satisfaction. However, most of this research has focused on large organizations with well-established management systems and adequate resources. In contrast, studies examining the application of Six Sigma in MSMEs remain limited, particularly within the culinary sector. MSMEs possess distinct characteristics, such as limited capital, minimal process standardization, and limited understanding of quality management. Moreover, previous research has generally focused solely on production aspects, without integrating quality dimensions comprehensively, such as product quality (Ayu et al., 2024), service quality (Song et al., 2022), pricing (Pertiwi et al., 2022), and customer experience (Ariasa et al., 2020).

East Kalimantan represents a relevant context due to its rapid economic growth and increasing business competition, particularly following the development of the new National Capital (IKN). In this situation, food souvenir MSMEs play a strategic role as pillars of the local economy. This condition presents an opportunity to examine the adaptation of quality management practices within MSMEs in developing regions.

Accordingly, a research gap exists in the absence of a systematic application of the Six Sigma method to determine quality improvement priorities in food souvenir MSMEs in developing regions using a multidimensional approach. The novelty of this study lies in: (a) the application of Six Sigma to small-scale food souvenir MSMEs; (b) the integration of product, service, pricing, and customer experience dimensions within the Six Sigma framework; and (c) the implementation of this method in a developing regional context characterized by unique economic conditions. This study aims to identify the dominant quality-related issues, analyze their root causes, and formulate comprehensive quality improvement priorities. This study contributes to the literature by extending the theoretical discourse on Six Sigma within the MSME sector through empirical insights, while also offering practical recommendations to enhance competitiveness and long-term business sustainability.

2. Method

2.1. Research Subject

The subjects of this study were customers who had previously purchased products from food souvenir MSMEs in East Kalimantan, totaling 200 respondents. Respondents were selected using a purposive sampling method, defined as a sampling technique based on specific criteria aligned with the research objectives (Sugiyono, 2017). The established criteria were: (a) respondents had made more than one purchase, and (b) the purchases were made at food souvenir shops located in Balikpapan, Samarinda, and Bontang. The repeated-purchase criterion was applied to ensure that respondents possessed sufficient consumption experience, enabling them to provide consistent evaluations of the products or services received. These three cities were selected because they represent major economic centers in East Kalimantan and host a substantial number of food souvenir MSMEs, thereby reflecting the characteristics of the study area. Before completing the questionnaire, respondents were asked a screening question about their purchase frequency. Only those who indicated that they had made more than one purchase were included in the study. Based on calculations using the Lemeshow formula with a 95% confidence level and a 10% margin of error, the minimum required sample size was 96 respondents. However, the number of respondents was increased to 200 to enhance data adequacy and strengthen the robustness of the research findings.

2.2. Research Instrument

The research instrument employed in this study was a customer satisfaction questionnaire designed to measure the level of importance and performance of each quality attribute under investigation. The instrument was adapted and modified from previously developed instruments, encompassing the dimensions of product quality (Ayu et al., 2024), service quality (Song et al., 2022), pricing (Pertiwi et al., 2022), and customer experience (Ariasa et al., 2020). These four dimensions were subsequently elaborated into a set of specific attributes, as presented in Table 1 (Research Dimensions and Attributes). Prior to the main data collection, the instrument was subjected to a pilot test involving 30 respondents to ensure the clarity of the questionnaire items and the appropriateness of the measurement context (Azwar, 2020). Measurement was conducted using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to assess respondents' perceptions of each research attribute.

2.3. Research Stage

This research uses the Six Sigma method with the DMAIC (Define, Measure, Analyze, Improve, Control) framework. This approach is systematic for identifying, analyzing, and improving quality problems in a measurable, sustainable way. The stages of the research are explained as follows:

a. Define

This stage aims to define the scope of the study, establish the research objectives, and determine the quality dimensions along with their corresponding measurement attributes to be used in the analysis (Monday, 2022).

b. Measure

This stage aims to measure the current level of service performance based on the results of the customer satisfaction questionnaire. Data were collected using a questionnaire that assessed customers' perceptions of service performance relative to expected satisfaction targets. Unlike the Defects Per Million Opportunities (DPMO) concept in the manufacturing sector, which counts product defects, this study applies a modified DPMO approach tailored to service quality. In this study, a "defect" is defined as a discrepancy between the service performance customers perceive and the expected satisfaction target. As Seen in Eq. (1) and Eq. 2, the modification to the DPMO calculation follows the method described in a previous study (Dwijayanti & Fani, 2022). The calculation steps are as follows: (1) DPMO Measurement, (2) Sigma Level Measurement.

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$$[1 - (Performance / Satisfaction\ Target) \times 100\%)] \times 1000000 \quad (1)$$

$$Normsinv\ [1 - (DPMO / 1000000)] + 1{,}5 \quad (2)$$

c. Analyze

This stage aims to identify the root causes of the identified problems based on the measurement results (Al-Qatawneh et al., 2025). The analysis was conducted using two techniques: Importance–Performance Analysis (IPA) and the Fishbone Diagram. The IPA method was employed to map quality attributes into four quadrants: Quadrant I (top priority for improvement), Quadrant II (maintain performance), Quadrant III (low priority), and Quadrant IV (possible overperformance) (Wu et al., 2023), as illustrated in Fig. 1 below.

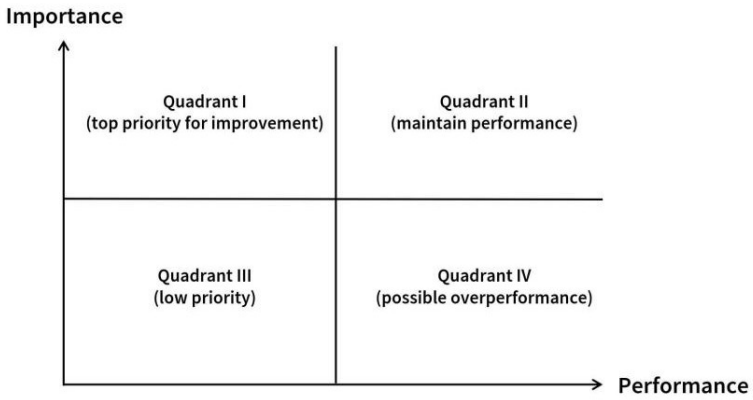

Fig. 1. IPA Diagram

Attributes in Quadrant I were subsequently analyzed using a Fishbone Diagram to identify the underlying root causes of the problems. The results of the root cause analysis were then visualized in the form of a cause-and-effect (fishbone) diagram (Hu et al., 2025).

d. Improve

This stage aims to formulate solutions to the problems found in the analysis stage (Wartati et al., 2021). The technique used is brainstorming to generate ideas for improvement.

e. Control

This stage aims to ensure that the proposed improvements can be sustained in the long term. The control stage is limited only to the formulation of Key Performance Indicators (KPIs) as a performance measurement tool. The formulated KPIs can later be used by business actors as a guide for monitoring and evaluating improvements (Al-Qatawneh et al., 2025).

3. Results and Discussion

3.1. Define

At the Define stage, the study focused on food souvenir MSMEs in East Kalimantan, specifically in Balikpapan, Samarinda, and Bontang. The objective of this study was to identify the dominant quality-related issues and determine quality improvement priorities. The quality dimensions analyzed included product quality, service quality, pricing, and customer experience. Each dimension was further elaborated into specific research attributes, which served as the basis for analysis in the subsequent stages. The research dimensions and attributes are presented in Table 1 below.

Table 1. Research dimensions and attributes

No.	Dimension	Attributes Num-	Attributes Name
1	Product quality	1	The product's taste matches my expectations
		2	The products have a wide variety of flavors
		3	The taste, shape, and size of the product are always consistent every time I buy
		4	Products reflect the characteristics of East Kalimantan
		5	The product remains good and worth consuming for up to a few days after purchase
		6	Product packaging looks attractive
		7	The information on the packaging (i.e., the ingredients, the expiration date) is clearly listed
		8	The size and weight of the product are in accordance with the packaging information
		9	The products of the shop have a good reputation among customers
2	Service quality	10	The shop looks clean and tidy
		11	Neat and professional-looking staff
		12	The staff serves purchases smoothly with minimum errors
		13	Staff are quick to help when customers need help
		14	Staff are active in offering help or recommendations
		15	The staff understand the products and can answer questions clearly
		16	The service provided by the store staff is comfortable for customers
		17	Staff serve in patiently and friendly manner
3	Pricing	18	The price of the product matches the taste, packaging design, and size
		19	The price of the product is more affordable than in other souvenir shops
4	Customer experience	20	The shop provides a variety of interesting products to choose from
		21	The shop provides product samples to taste before buying

3.2. Measure

3.2.1. Validity and Reliability Tests

Validity and reliability tests of the research instrument were conducted to ensure its adequacy prior to further analysis (Amirzadeh et al., 2024). The results of the validity and reliability tests are presented in Table 2 and Table 3 below.

Table 2. Validity test

No.	Dimension	Number of Attributes	Value r
1	Product quality	9	0.438-0.775
2	Service quality	8	0.535-0.863
3	Pricing	2	0.508-0.753
4	Customer experience	2	0.453-0.645

Table 3. Reliability test

Cronbach's Alpha
0.934

According to Table 2 of the validity test, all items have a total item correlation coefficient (rix) greater than 0.300, indicating that they are valid (Yildiz, 2024). Meanwhile, based on Table 3 of the reliability test, Cronbach's Alpha value is greater than 0.6. It means the research instrument is reliable and consistent, and can be trusted for future data processing.

3.2.2. Calculating the Average Importance and Performance Value

After the research instrument was confirmed as valid and reliable, the mean importance and performance scores for each quality attribute were calculated based on respondents' perceptions.

These mean values were used to represent the importance and performance of each attribute as a basis for subsequent analysis. The calculation results are presented in Table 4 below.

Table 4. Importance and performance value of each attribute

Attributes Num-	Importance Value	Performance Value
1	4.815	4.410
2	4.745	4.250
3	4.805	4.405
4	4.745	4.435
5	4.790	4.390
6	4.735	3.830
7	4.815	4.330
8	4.810	4.240
9	4.690	4.130
10	4.765	4.085
11	4.800	3.455
12	4.795	4.365
13	4.790	4.350
14	4.800	3.435
15	4.790	4.370
16	4.795	4.400
17	4.805	4.345
18	4.785	4.365
19	4.765	4.070
20	4.745	4.315
21	4.805	2.665

3.2.3. Calculating Sigma Level

The sigma level reflects the operational capability of MSMEs to meet customer expectations, based on the rate of errors in the service process. A higher sigma level indicates better process quality, whereas a lower sigma level suggests a greater likelihood of errors or customer dissatisfaction. The results of the sigma level calculation are presented in Table 5 below. Based on the calculation results, a sigma level of 2.435 was obtained, indicating that the operational capability of MSMEs is still relatively low. This result suggests that process variability remains high, leading to a higher likelihood of errors. As a consequence, service performance has not fully met customer expectations. In the Six Sigma framework, processes operating at 2–3 sigma generally indicate a high defect rate and unstable process performance. In contrast, established industries typically target a minimum performance level of 4 sigma, while world-class industry standards operate at 6 sigma (Putra & Basri, 2024). Therefore, the sigma level obtained in this study indicates that quality management practices among culinary souvenir MSMEs in East Kalimantan still need improvement. This finding is consistent with studies in the service sector showing that organizations with poorly standardized processes tend to have lower sigma levels and require systematic improvements to enhance service quality (Novadi & Mahbubah, 2021).

From the perspective of service quality theory, high process variability can directly affect customer satisfaction. The implementation of the Six Sigma method can help identify process discrepancies and design improvement strategies to reduce such variability. As a result, service quality can become more consistent and better aligned with customer expectations. Other studies on MSMEs have also shown that the application of the Six Sigma method can improve service performance by reducing process variability (Pfeifer, 2022). In practice, a low sigma level indicates that MSMEs need to strengthen process control and quality management practices gradually. Although within the MSME context, sigma levels between 2 and 3 are still commonly found, particularly during the early stages of quality management implementation. By reducing process variability and improving internal capabilities, MSMEs can minimize operational errors, maintain service consistency, and ultimately enhance customer satisfaction.

Table 5. Sigma level calculation

Attributes Num-	Importance Value	Performance Value	DPMO	Sigma Level
1	4.815	4.410	118000	2.685
2	4.745	4.250	150000	2.536
3	4.805	4.405	119000	2.680
4	4.745	4.435	113000	2.711
5	4.790	4.390	122000	2.665
6	4.735	3.830	234,000	2.226
7	4.815	4.330	134,000	2.608
8	4.810	4.240	152,000	2.528
9	4.690	4.130	174,000	2.438
10	4.765	4.085	183,000	2.404
11	4.800	3.455	309,000	1.999
12	4.795	4.365	127,000	2.641
13	4.790	4.350	130,000	2.626
14	4.800	3.435	313,000	1.987
15	4.790	4.370	126,000	2.646
16	4.795	4.400	120,000	2.675
17	4.805	4.345	131,000	2.622
18	4.785	4.365	127,000	2.641
19	4.765	4.070	186,000	2.393
20	4.745	4.315	137,000	2.594
21	4.805	2.665	467,000	1.583
Average	**4.780**	**4.126**	**174,857**	**2.435**

3.3. Analyze

3.3.1. Identify Improvement Priorities

Improvement priorities were identified using the IPA method by mapping quality attributes to their importance and performance scores. The IPA method is widely used in quality research because it can identify important attributes that do not meet customer expectations. Through such mapping, attributes with high importance but low performance can be clearly identified. The results of the IPA analysis are shown in Fig. 2 below.

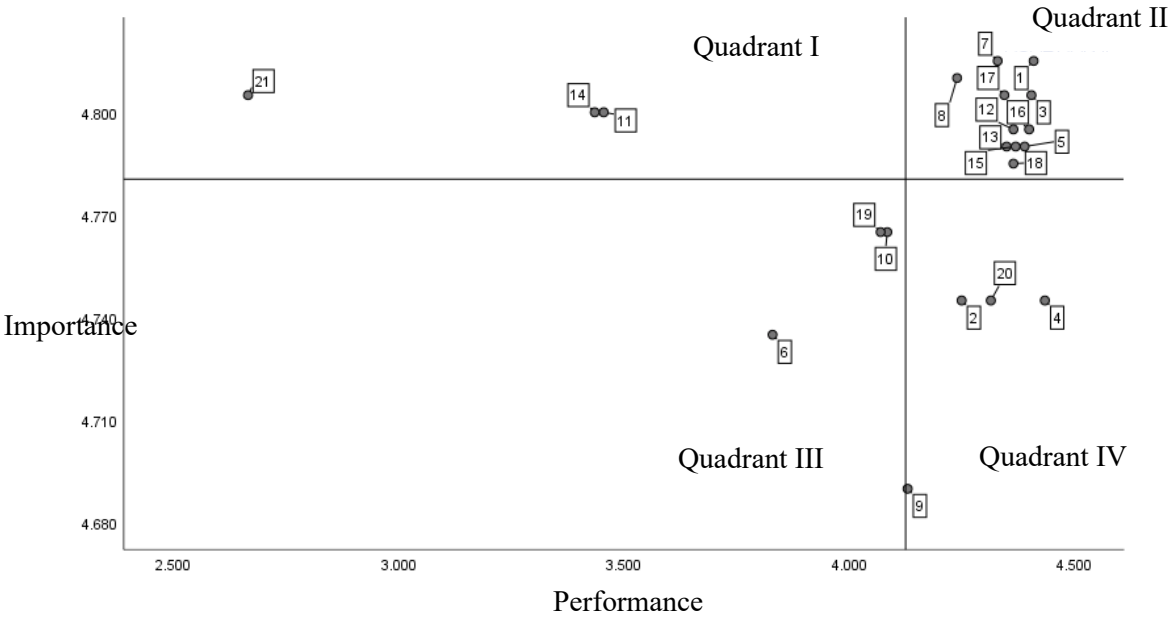

Fig. 2. IPA Diagram

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The results of the IPA analysis showed that there were three attributes with low performance as the main priorities for improvement, consisting of attribute number 11 (Neat and professional looking staff), attribute number 14 (Staff is active to offer help or recommendations), and attribute number 21 (The store provides product samples to taste before buying). These three attributes are critical as they are directly associated with the tangible and responsiveness dimensions of service quality. Previous studies have demonstrated that these two dimensions significantly influence perceived service quality and customer satisfaction, particularly in the service sector (Mukuka & Chasha, 2025; Setiono & Hidayat, 2022). Improvements in these areas are therefore expected to generate the greatest impact on enhancing service quality and customer satisfaction.

In addition, the socio-cultural context may also influence the importance of these attributes. In many Asian consumer cultures, interpersonal interaction between staff and customers plays an important role in shaping service experiences. Customers often expect friendly communication, proactive assistance from staff, and opportunities to interact directly with service providers. Cultural factors can therefore influence how customers evaluate service encounters and express satisfaction with service experiences (Truong, 2025).

3.3.2. Identify the Root of the Problem

Once the improvement priorities are determined, the next step is to identify the root cause of each attribute that needs improvement. This analysis is important so that the improvements made can address the main cause of these attributes' low performance. The root problem is identified using fishbone diagrams. Fishbone diagrams have been found effective in identifying the underlying causes of problems (Budiman & Mela, 2025; Hu et al., 2025). The identification results are shown in the following Fig. 3, Fig. 4, and Fig. 5.

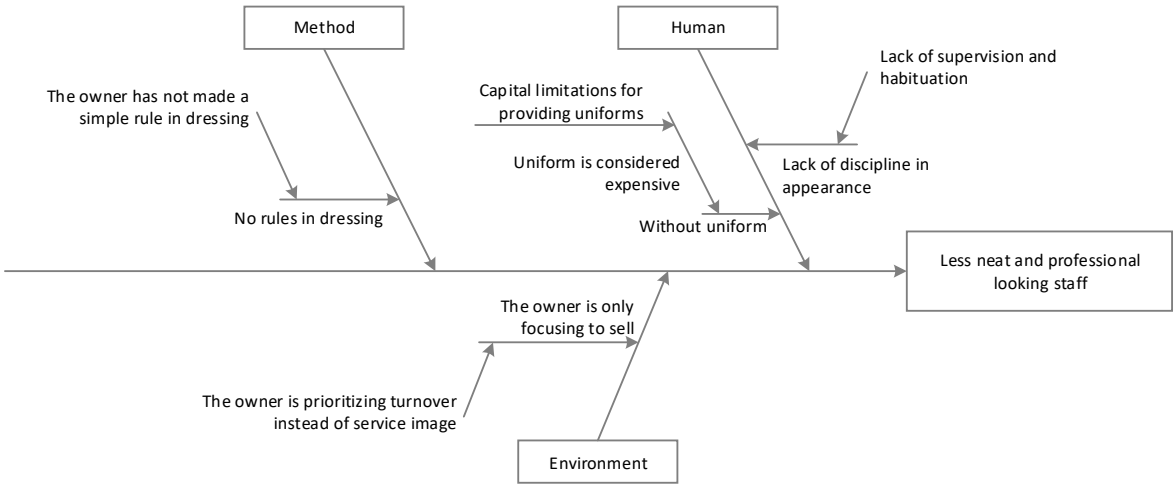

Fig. 3. The root problem of the 11th attribute

Fig. 3 is the result of identification using the fishbone diagram in attribute 11, "Neat and professional looking staff". Human factors, methods, and the environment influence low performance. From the human resources side, limited capital for uniforms, as well as a lack of supervision and staff habituation, create difficulties in maintaining staff appearance standards. In terms of methods, the absence of a dress code (uniform SOP) leads to inconsistent staff appearance. In fact, research shows that the suitability of staff uniform affects service quality expectations (Sotak et al., 2024). Meanwhile, regarding the environment, the owner prioritizes achieving sales turnover over investing in the shop's image. This aligns with research highlighting organizations' tendency to focus on short-term business performance (Gerlich, 2023).

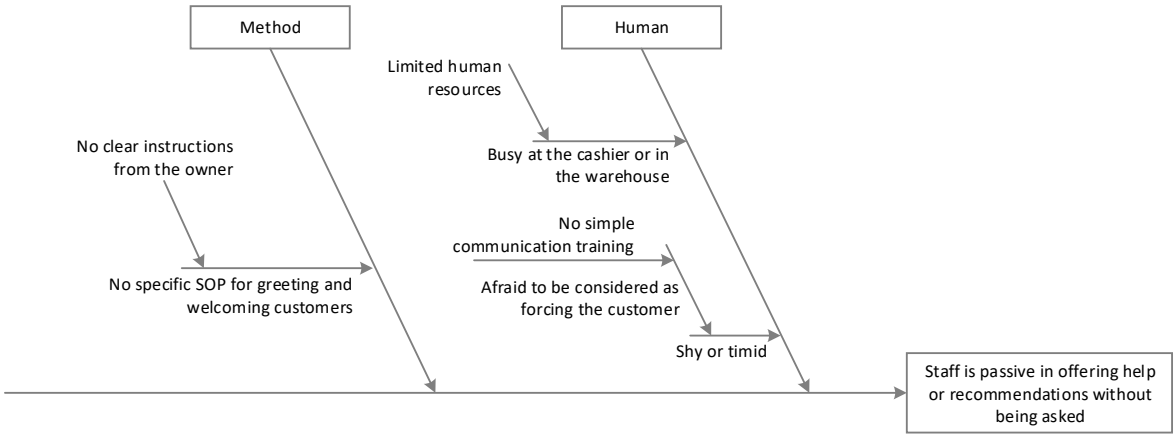

Fig. 4. The root problem of the 14th attribute

Fig. 4 is the result of identification using the fishbone diagram on attribute 14 "Staff are active to offer help or recommendations". Human factors and methods influence low performance. From the human resource side, the factor is the absence of simple training on communication with customers, such as the ability to greet and offer help, as well as the limited number of staff that cause the focus of staff to be divided on different tasks such as staying at the checkout counter or in the warehouse. In terms of methods, business owners have not yet clear instructions regarding service standards, such as procedures for greeting and welcoming customers and proactively offering assistance. The latest study shows that communication skills have a significant effect on customer satisfaction, especially proactive customer interaction (Tanković et al., 2023).

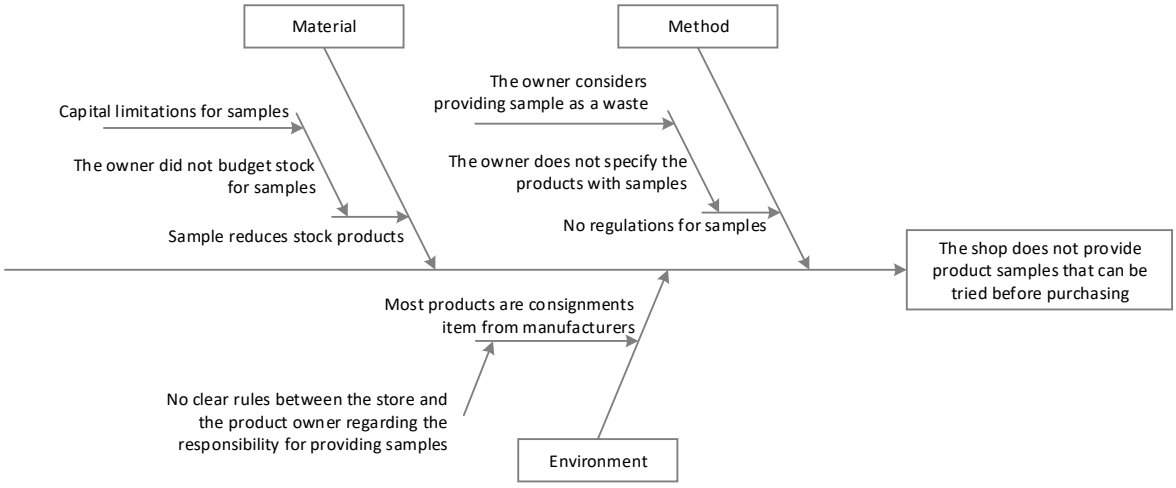

Fig. 5. The root of the problem of the 21st attribute

Fig. 5 shows the results of identification using a fishbone diagram for attribute 21, "The store provides product samples to taste before buying". Low performance is influenced by method, material, and environmental factors. In terms of methods, the root problem is that the business owners consider the provision of samples as a waste. In terms of materials, limited capital is the main obstacle to providing samples. Meanwhile, from an environmental perspective, there is no clear boundary for who is responsible for providing samples between shop owners and product owners, so samples are not consistently available. The latest research found that product samples can increase sales and strengthen customer trust in products and shops (Kusuda, 2025).

3.4. Improve

After the root of the problem is identified, the next stage is to develop recommendations for improvement that align with field conditions. Thus, the improvement recommendations will be on target and easy for business actors to apply. The results of the improvement recommendations are shown in Table 6 below.

Table 6. Recommended improvements

No.	Attribute	The Root Problem	Recommended Improvements	Executive
1	Neat and professional-looking staff	Capital limitations (uniform costs)	Set modest standards (e.g., collared shirts) without a special-bought uniform	Owners and staff
		There are no simple rules of uniform	Create simple dress code rules and stick them in the staff-only space	Owner
		Lack of supervision and habituation	The owner gives a briefing of the rules at the beginning of each shift and address any staff who do not follow the rules	Owner
2	Staff are active in offering help or recommendations	No simple communication training	Hold short training internally on simple communication with customers	Owner
		Human Resources Limitations	Set work schedules in turn (1 staff focus as the cashier, 1 staff focus on welcoming and aiding customers)	Owner
		There are no clear instructions regarding service standards	Set simple rules, e.g., every customer must be greeted and welcomed once entering	Owner
3	The shop provides product samples to taste before buying	Capital constraints for *samples*	Provide a limited sample for only featured products or new products	Owner
		The owner considers *the samples* a waste	Conduct a limited sample strategy, then evaluate the sales impact in 1 month	Owner
		Responsibility for the provision of *samples* is not clearly determined between the store and the product owner	Negotiate with the supplier to provide 1 piece, particularly used for the samples	Owner

Based on Table 6, the improvement recommendations focus on simple solutions that suit the conditions of MSMEs. Regarding staff appearance, improvements are made through the establishment of simple, neat clothing standards. This step is important because staff appearance has been shown to affect service performance (Mon & Ferina, 2024; Sotak et al., 2024). Furthermore, in customer communication, improvements are achieved through short training sessions to enhance interaction. Good communication has been shown to improve customer satisfaction (Tanković et al., 2023). Meanwhile, in the product samples attribute, improvements are made by limiting samples to feature products (flagship or high-selling items) or new products to enhance the customer's shopping experience. The use of samples has been shown to affect customers' decisions to buy (Loupiac & Le Nagard, 2024).

3.5. Control

The final stage is the Control phase, which is carried out through the formulation of Key Performance Indicators (KPIs). These indicators serve as performance measurement tools to ensure the sustainability of the proposed improvements. The formulated KPIs can be utilized by business

owners as guidelines to periodically monitor and evaluate the implementation of improvement initiatives, as well as to maintain MSME quality standards (Balon et al., 2024; Zaitsev, 2023). The results of the KPI formulation are presented in Table 7 below.

Table 7. Key performance indicator

No.	Recommended Improvements	Key Performance Indicator (KPI)	Target	Evaluation Period
1	Set modest standards (e.g., collared shirts) without a special-bought uniform	% of staff present as per dress standards	≥ 80% of staff consistently dress according to the rules	Weekly
2	Create simple dress code rules and stick them in the staff-only space	Written rules are available and visible in the store	Rules available	Implemented once
3	The owner gives a briefing of the rules at the beginning of each shift and address any staff who do not follow the rules	Number of short briefings conducted before a shift	At least thrice a week	Weekly
4	Hold short training internally on simple communication with customers	Number of short training sessions conducted	Once per month	Monthly
5	Set work schedules in turn (1 staff focus as the cashier, 1 staff focus on welcoming and aiding customers)	Percentage of customers who get an initial greeting	≥ 80% of customers are greeted and welcomed	Daily
6	Set simple rules, e.g., every customer must be greeted once when entering	Number of warnings if staff don't greet customers	≤ 2 warnings per week	Weekly
7	Provide a limited number of samples to only featured products or new products	Number of products with samples available	There are at least 2 featured products with samples	Weekly
8	Conduct a limited sample strategy, then evaluate the sales impact in 1 month	Comparison of product sales with and without samples	Products with samples up ≥ 10% in 2 months	Monthly
9	Negotiate with the supplier to provide 1 piece, specifically for the samples.	Number of suppliers agreeing to provide sample	At least 1 supporting supplier	Per 3 months

4. Conclusion

The findings indicate that the sigma level of food souvenir MSMEs in East Kalimantan remains relatively low at 2.435. This result suggests that MSMEs' process capability for meeting customer expectations remains limited. The IPA analysis identified three priority attributes for improvement: staff appearance, communication skills with customers, and the provision of product testers. These findings highlight that service quality enhancement is a key factor in increasing customer satisfaction. The KPIs formulated in this study can serve as practical guidelines for MSME practitioners to monitor and continuously evaluate quality improvement efforts. Theoretically, this study extends the application of the Six Sigma method to culinary MSMEs, a sector in which the method has traditionally been more widely used in manufacturing. The study also demonstrates that integrating Six Sigma and IPA can serve as a customer-perception–based quality analysis framework for small-scale enterprises. Practically, the results provide measurable improvement priorities for MSME practitioners seeking to enhance quality incrementally. The resulting KPIs can be used to monitor performance and maintain consistency in quality improvement initiatives. This study is limited by its geographic scope, focusing solely on food souvenir MSMEs in three major cities of East Kalimantan, and it does not evaluate the long-term implementation of the proposed KPIs. Future research is recommended to develop a more conceptual quality improvement model by integrating aspects of service digitalization, human resource readiness, and product innovation, thereby enabling food souvenir MSMEs in East Kalimantan to strengthen their competitiveness at both local and national levels.

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Conflicts of Interest: The authors declare no conflict of interest.

Research Ethics: This study was conducted in accordance with established research ethics principles. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. All respondent information was kept confidential and used solely for research purposes, with no personal identities disclosed in the reporting of the findings**.**

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