

ISO 9001 implementation in Indonesian food SMEs: evidence from a case study on benefits and challenges

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Abstract. The adoption of ISO 9001 standards has become increasingly vital for small and medium-sized enterprises (SMEs) in Indonesia's food sector, as they face growing competition and demands from the global market. This study aims to examine the benefits and challenges of ISO 9001 implementation in food SMEs. A qualitative research method was employed, utilizing a case study design involving five SMEs certified with ISO 9001. Preliminary data were collected through a literature review, followed by validation through in-depth interviews, direct observations, and document analysis, which were then analyzed thematically. The findings reveal that the primary benefits of ISO 9001 implementation include enhanced product and service quality, improved customer satisfaction, and strengthened organizational image and reputation. Nevertheless, variations were observed in other benefits such as operational efficiency, internal communication, and delivery reliability. The main challenges identified include limited management support, external bureaucratic constraints, technical difficulties, and risk management issues. In addition, financial constraints, employee resistance, and human resource competency gaps emerged differently across the SMEs. This research highlights that the success of ISO 9001 implementation is strongly influenced by both internal and external factors, suggesting the need for policy support, continuous training, and multi-stakeholder collaboration to optimize its impact.

1 Introduction

Food SMEs hold a strategic role in Indonesia's economy. This sector not only contributes significantly to the national Gross Domestic Product (GDP) but also plays a crucial role in employment generation and improving community welfare [1]. Among SMEs, the food industry is one of the largest subsectors, characterized by the highest number of enterprises, the most significant labor absorption, and the broadest consumer base. According to data from the Central Statistics Agency of Indonesia, the number of SMEs in Indonesia reached 4.34 million units in 2022. In the midst of intensifying global competition and rising consumer demand for quality and food safety, food SMEs are compelled to raise their

production standards to remain competitive with imported products and large-scale producers.

In response to these challenges, certification has become an important mechanism for enhancing compliance, quality assurance, and market competitiveness among Indonesian SMEs. Various certification schemes, ranging from mandatory regulatory and food safety certifications to voluntary management systems and product quality standards, are applied with different scopes and objectives. This overview situates ISO 9001 within the broader certification landscape relevant to food SMEs in Indonesia.

One of the most effective strategies to address these challenges is the adoption of an internationally recognized quality management system, namely ISO 9001 [2]. ISO 9001 embraces a process-based approach that integrates the Plan-Do-Check-Action (PDCA) cycle and risk-based thinking [3]. ISO 9001 has been widely reported to enhance operational performance, customer satisfaction, financial outcomes, and risk control [4]. However, its implementation remains challenged by high costs, limited resources, resistance to change, and difficulties in sustaining compliance, alongside weaknesses in leadership, continuous improvement, evidence-based decision making, and risk management [5].

Although extensive research has been conducted on ISO 9001 implementation, most studies have concentrated on large industries or non-food manufacturing sectors. Research focusing specifically on food SMEs in Indonesia remains scarce. This is concerning, as food SMEs possess unique characteristics, such as the sheer number of producers and consumers, and their direct impact on consumer health, safety, and well-being. Unsafe food products may pose severe threats to consumer health and even life [6]. Additionally, Indonesian food SMEs typically face limited capital, operate on small production scales, and are deeply influenced by local cultural practices in business management, which may affect the effectiveness of quality standard implementation.

The novelty of this study lies in its comprehensive examination of the benefits and challenges of ISO 9001 implementation, specifically in Indonesian food SMEs. Distinct from the majority of previous studies, which tend merely to reaffirm findings already established in the international literature, this research positions itself by directly validating those findings within the unique local context of Indonesia. Such an approach not only strengthens the credibility of the results but also highlights contextual nuances that are often overlooked when research is predominantly conducted in large industries or in foreign settings with different regulatory, cultural, and operational conditions. Consequently, the study provides a more grounded and empirically relevant perspective for Indonesian SMEs, which frequently depend on practices adapted from larger corporations or international standards that may not fully align with their specific realities.

The contribution of this research is twofold. First, it offers practical insights for SME practitioners by emphasizing the importance of quality management and serving as a reference point for policymakers and certification bodies in designing supportive programs. Second, it contributes academically by enriching the relatively limited body of literature on quality management within the food SME sector in Indonesia.

Based on this background, the objectives of the study are threefold: (1) to identify the benefits gained by food SMEs from ISO 9001 adoption, (2) to explore the challenges encountered during its implementation, and (3) to provide practical recommendations for SMEs, certification bodies, and government agencies to strengthen the competitiveness of Indonesia's food SMEs through the adoption of international quality standards.

2 Methods

2.1 Research Design

Most empirical studies on ISO 9001 have predominantly employed quantitative approaches. While such approaches provide valuable insights into potential benefits and challenges, they are often influenced by respondents' social desirability bias. As a result, findings tend to reflect idealized perceptions rather than capturing the actual complexity of SMEs' internal dynamics in ISO 9001 implementation.

In response, this study adopts a qualitative approach with a holistic case study design. A qualitative method is considered more suitable as it allows for in-depth exploration of the benefits and challenges of ISO 9001 adoption within food SMEs. This approach is particularly relevant given the limited research on ISO 9001 implementation in Indonesia's food SME sector, where firsthand, experience-based insights are needed to enrich the existing literature. Case study methodology is deemed appropriate when the objective is to understand complex social phenomena, as it enables researchers to capture the holistic and meaningful characteristics of real-life events. By employing case studies, this research accommodates the complexity, ambiguity, and interpretive diversity inherent in ISO 9001 implementation among food SMEs.

Initial data were collected through an extensive literature review, followed by validation via in-depth interviews, field observations, and the analysis of internal documents from the SMEs under study. Drawing on direct experiences, the study aims to construct a comprehensive understanding of the benefits, challenges, and adaptive strategies employed by SMEs in implementing ISO 9001. This approach enables the research to present a more contextualized account of ISO 9001 adoption within Indonesian food SMEs, thereby contributing not only theoretical insights but also practical implications for SMEs considering ISO 9001 adoption.

The research was conducted from January to July 2025. Primary data collection on the benefits and challenges of implementing ISO 9001 in SMEs took place between June and July 2025. The research sample consisted of food-sector SMEs in Central Java Province that were receiving mentoring from the National Standardization Agency of Indonesia.

2.2 Case selection

The selection of SMEs as research subjects was guided by their relevance to the study's objectives: identifying the benefits and challenges of ISO 9001 implementation in Indonesia's food sector. The criteria were as follows. First, the selected firms had to meet the formal definition of SMEs under Indonesian regulations and possess ISO 9001 certification. Priority was given to SMEs with greater experience in adopting ISO 9001, ensuring that the data accurately reflected actual implementation practices. Second, the degree of researcher control over the observed phenomena was considered; cases with lower researcher intervention were preferred, as they more reliably represented the real-world conditions of SMEs. Third, the focus was on contemporary phenomena rather than historical events, to ensure relevance to current dynamics in ISO 9001 adoption among food SMEs.

Based on these criteria, five ISO 9001-certified food SMEs in Indonesia were selected as units of analysis. The sampling technique employed was purposive sampling, in which cases were deliberately selected based on specific criteria: SMEs with more than 5 years of ISO 9001 experience and sufficient access to internal data. The characteristics of the selected SMEs are presented in Table 1.

Table 1. Profiles of food SME respondents

Category	SME A	SME B	SME C	SME D	SME E
Main products	Presto milkfish	Noodles	Instant seasoning	Mineral water	Tea
Markets	National	National	National and export (5%)	Local	National and export (5%)
Established	2004	2015	1977	2019	2015
Number of employees	10	12	25	6	8
Certified in accordance with	ISO 9001:2015	ISO 9001:2015	ISO 9001:2015	ISO 9001:2015	ISO 9001:2015
Year of first certification	2015	2019	2005	2019	2018

The number of SMEs was determined using the principle of theoretical saturation, in which data collection is concluded when additional information no longer yields significant new insights. Although more SMEs initially expressed willingness to participate, only one subset was selected as core cases, as they met the criteria of sustained ISO 9001 implementation and provided the most comprehensive access to relevant data.

2.3 Data Collection and Analysis

Data was gathered through a triangulation of methods, combining interviews, observations, and document analysis, to enhance credibility. First, semi-structured interviews were conducted with SME owners directly involved in ISO 9001 implementation. The interview protocol included both closed-ended questions (derived from the literature review) and open-ended questions to elicit respondents' lived experiences. Second, non-participant observations were carried out during site visits to examine production processes, quality management practices, and daily interactions related to ISO 9001. Informal conversations with operational staff further enriched the data. Third, documentary analysis was conducted on quality manuals, standard operating procedures (SOPs), work instructions, quality records, and internal and external audit reports provided by the SMEs.

Data analysis employed thematic analysis, involving data reduction, categorization, and interpretation of findings. To encourage openness and reduce the likelihood of organizational silence (the tendency to conceal problems), the researcher ensured the confidentiality of both respondents' identities and company information.

3 Results And Discussion

3.1 Literature Study on Benefits and Challenges of Implementing ISO 9001

The ISO QMS standard is intended to provide organizations with a practical tool that delivers significant advantages when properly implemented. ISO 9001 is designed to apply to businesses of all types and sizes, offering flexibility while maintaining full compatibility with other international management standards. This makes ISO 9001 a strategic opportunity that is highly relevant to contemporary business challenges and market demands [7]. The benefits and challenges of QMS implementation for SMEs are summarized in Tables 2 and 3.

Table 2. Benefits of ISO 9001 implementation in SMEs

No	Benefit	Description	Reference
1.	Product and service quality	Increases quality awareness, reduces defects and nonconformities, and fosters product and service innovation.	[8]
2.	Operational efficiency and productivity	Enhances operations, productivity, and personnel efficiency and reduces customer complaints through standardized processes.	[8]
3.	Organizational performance	Improves overall organizational performance, facilitates managerial process re-engineering, and promotes a culture of continuous improvement.	[7]
4.	Competitiveness and market access	Strengthens competitiveness, enables market penetration, expands markets, boosts exports, and enhances resilience to external pressures.	[8] [9]
5.	Customer satisfaction and relations	Improves customer satisfaction, reduces complaints, strengthens customer relationships, and enables better identification of current and future needs.	[7]
6.	Internal communication and collaboration	Enhances internal communication, employee participation, and engagement in maintaining quality.	[8]
7.	Organizational image and reputation	Strengthens the corporate image and fosters stakeholder trust by complying with international quality standards.	[8]
8.	Economic and financial gains	Supports profitability and cost efficiency, and positively impacts financial performance.	[8]
9.	Regulatory compliance	Ensures conformity with legal and regulatory requirements and facilitates access to significant projects, including government procurement.	[7]
10.	Delivery reliability and timeliness	Improves product delivery timeliness, directly influencing customer satisfaction and corporate credibility.	[7]

Table 2 summarizes the key benefits of ISO 9001 implementation in SMEs as reported in previous studies. These benefits span improvements in product and service quality, operational efficiency, and overall organizational performance through standardized processes and continuous improvement practices. ISO 9001 also contributes to enhanced competitiveness, market access, customer satisfaction, and organizational reputation, while supporting regulatory compliance, delivery reliability, and positive economic and financial outcomes for SMEs.

Table 3 highlights the main challenges faced by SMEs in implementing ISO 9001. These challenges primarily relate to financial and resource constraints, limited knowledge and competencies, and employee resistance to change. Additional barriers include insufficient leadership commitment, external and bureaucratic obstacles, and technical difficulties, particularly in meeting risk management requirements within the quality management system.

Table 3. Challenges of ISO 9001 Implementation in SMEs

No	Challenge	Description	Reference
1.	Financial and resource constraints	High costs, their impact on working capital, the need for additional human resources, and the extra time required for procedural implementation.	[10][2]
2.	Lack of knowledge and competencies	Limited understanding of ISO 9001, insufficient employee training, and inadequate guidance from supporting institutions.	[2]
3.	Employee resistance and involvement	Staff resistance to change, lack of commitment, and limited employee participation in QMS practices.	[10] [2]
4.	Leadership and management support	Insufficient commitment and leadership from top management.	[10] [2]
5.	External barriers and bureaucracy	Limited access to consultancy services, lack of institutional support, and bureaucratic obstacles.	[10]
6.	Technical and risk management issues	Challenges in fulfilling risk management requirements and technical aspects of QMS.	[2]

3.2 Benefits of ISO 9001 Implementation in Food SMEs

The validated benefits of ISO 9001 adoption across the five food SMEs studied (SME A, B, C, D, and E) are presented in Table 5. These benefits were initially identified through a literature review and subsequently verified through interviews and field observations. Each benefit was categorized based on its contribution level: Primary (P) when it represented a significant outcome for the SME, Secondary (S) when it appeared as an additional or less dominant outcome, and Not Contributing (N) when the benefit was not relevant or experienced by the firm.

Table 4. Benefits of ISO 9001 implementation in food SMEs

No.	Benefit	SME				
		A	B	C	D	E
1.	Product and service quality	P	P	P	P	P
2.	Operational efficiency & productivity	P	P	P	S	S
3.	Organizational performance	P	P	P	S	P
4.	Competitiveness and market access	P	P	P	N	P
5.	Customer satisfaction and relations	P	P	P	P	P
6.	Internal communication and collaboration	S	S	P	N	N
7.	Organizational image and reputation	P	P	P	P	P
8.	Economic and financial gains	P	P	P	N	S
9.	Regulatory compliance	S	S	P	P	P
10.	Delivery reliability & timeliness	S	S	P	N	N

Notes: P = Primary, S = Secondary, N = Not contributing.

As shown in Table 4, several benefits consistently emerged across all SMEs. Improvements in product and service quality (No. 1), customer satisfaction and relationships (No. 5), and organizational image and reputation (No. 7) were unanimously recognized as primary benefits. This indicates that ISO 9001 adoption in food SMEs most visibly enhances aspects related to quality, customer trust, and corporate reputation, three critical elements in the food industry. Other benefits, such as operational efficiency and productivity (No. 2) and organizational performance (No. 3), were identified as primary by SMEs A, B, and C but only secondary or less significant for SMEs D and E. These variations suggest that ISO 9001 does not automatically translate into efficiency or performance gains; instead, the extent of impact depends on internal preparedness, resource availability, and consistency of implementation.

The benefits of competitiveness and market access (No. 4) also varied. Four of the five SMEs acknowledged tangible improvements, while SME D reported no significant effect. This highlights that while ISO 9001 can enhance market credibility, its benefits are more pronounced for SMEs that strategically leverage certification as a marketing tool. Conversely, benefits related to internal communication (No. 6), delivery timeliness (No. 10), and financial efficiency (No. 8) demonstrated more mixed outcomes. In some SMEs, these were perceived as secondary, while others reported no contribution. This indicates that ISO 9001 has not yet been fully optimized as a mechanism to improve internal coordination and logistics, even though the standard theoretically supports such enhancements. Regulatory compliance (No. 9) showed more consistency, with most SMEs acknowledging either primary or secondary contributions. This suggests that ISO 9001 plays a key role in helping SMEs comply with Indonesian legal requirements and food safety standards.

Beyond the ten identified benefits, ISO 9001 implementation in food SMEs also generated additional positive outcomes, including:

- Knowledge transfer and employee skill development.
- Enhanced readiness for other certifications (e.g., HACCP or ISO 22000).
- Improved risk management practices to prevent undesirable incidents.
- Strengthened trust with business partners.

ISO 9001 provides food SMEs not only with internationally recognized quality assurance but also with a competitive edge in an increasingly demanding market. The standard fosters a more structured, transparent, and improvement-oriented work culture. Ultimately, this drives consumer confidence, opens export opportunities, and contributes to long-term business sustainability.

Validation results from five Indonesian food SMEs indicate that the most significant benefits of ISO 9001 adoption include improved quality, enhanced customer satisfaction, and strengthened organizational reputation. Other benefits, such as operational efficiency, delivery reliability, and internal communication, were found to be more situational, depending heavily on the readiness and capacity of each SME. ISO 9001 thus functions not only as a formal certification instrument but also as an effective managerial strategy for strengthening competitiveness, particularly when supported by strong leadership commitment and adequate internal resources.

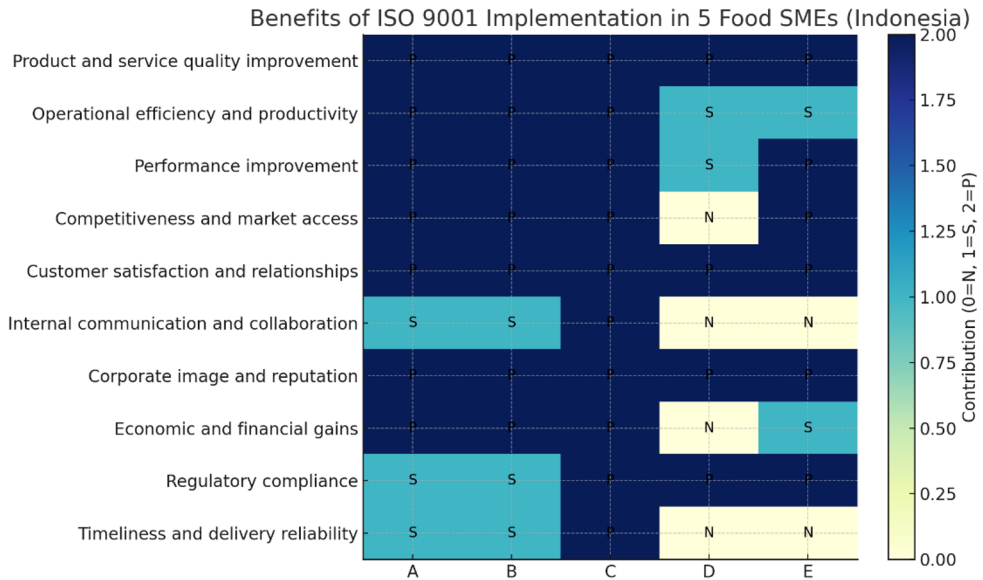


Fig. 1. Heatmap of ISO 9001 benefits reported by five food SMEs in Indonesia

As illustrated in Figure 1, the three fundamental benefits consistently observed across all SMEs are: (1) improved product and service quality, (2) customer satisfaction, and (3) organizational image and reputation. These findings are consistent with prior literature emphasizing that ISO 9001 serves as a quality-enhancement mechanism that adds value by building customer trust and reinforcing brand image [11]. Consistency across cases highlights that these three outcomes represent the most tangible and sustainable advantages of certification.

Other benefits, including operational efficiency, organizational performance, and market competitiveness, exhibited greater variation. This variation can be explained by differences in organizational readiness, managerial capability, and the extent to which ISO 9001 is integrated as a business strategy. Previous studies have similarly noted that efficiency gains are achieved only when quality standards are embedded in everyday operational practices, rather than treated merely as formal documentation [12]. Likewise, benefits such as internal communication, delivery reliability, and financial efficiency were found to be more situational, with some SMEs experiencing them positively but others not. These discrepancies confirm that ISO 9001 is not an automatic solution, but one whose effectiveness depends on managerial commitment and consistent implementation across organizational levels [11].

In addition, several complementary benefits were identified, including knowledge transfer and employee skill development, enhanced readiness for further certifications (e.g., HACCP, ISO 22000), improved risk management, and stronger trust from business partners. These findings reinforce the view that ISO 9001 generates multi-layered effects: beyond strengthening internal processes, it also creates strategic opportunities for long-term business growth. ISO 9001 may therefore be regarded as a managerial instrument of organizational transformation, enabling SMEs to transition toward more professional, quality-oriented business practices [13].

3.3 Challenges of ISO 9001 Implementation in Food SMEs

The validated challenges faced by the five Indonesian food SMEs in implementing ISO 9001 are summarized in Table 6. These challenges were initially drawn from the literature and later confirmed through interviews and field observations.

Table 6. Challenges of ISO 9001 implementation in food SMEs

No.	Challenges	SME				
		A	B	C	D	E
1.	Financial and resource constraints	S	S	S	P	P
2.	Lack of knowledge & competencies	N	N	N	P	P
3.	Employee resistance & involvement	S	S	S	S	P
4.	Leadership & management support	P	P	P	P	P
5.	External barriers & bureaucracy	P	P	P	P	P
6.	Technical & risk management issues	P	P	P	P	P

Notes: P = Primary, S = Secondary, N = Not contributing.

The most consistent challenges across all SMEs were leadership and management support (No. 4), external barriers and bureaucracy (No. 5), and technical and risk management issues (No. 6), all of which were perceived as primary obstacles. These findings underscore that ISO 9001 implementation in Indonesian food SMEs requires not only strong top management commitment but also effective navigation of bureaucratic procedures and technical limitations in risk management. Financial and resource constraints (No. 1) showed more variation. While SMEs A, B, and C perceived them as secondary challenges, SMEs D and E regarded them as primary challenges. This suggests that financial constraints and resource shortages are more critical for SMEs with weaker capital structures, whereas relatively stable firms experience them as supplementary rather than significant barriers.

Employee resistance and involvement (No. 3) tended to appear as secondary barriers for most SMEs, except in SME E, where it was considered a primary challenge. This variation implies that the degree of employee resistance is influenced by organizational culture and the effectiveness of internal communication in fostering employee engagement. In contrast, lack of knowledge and competencies (No. 2) emerged as a significant issue only for SMEs D and E, whereas the others did not perceive it as a significant hindrance. These differences may be explained by the varying levels of human resource readiness and the availability of training within the SMEs. Overall, the results suggest that the most pressing challenges in ISO 9001 implementation are related to leadership, bureaucratic constraints, and technical limitations, while employee resistance and knowledge gaps tend to vary across cases.

Beyond the six core challenges presented in the table, SMEs also reported several additional barriers, including:

- High costs of certification maintenance, covering periodic audits, product testing, training, and system updates.
- Limited access to digital technologies.
- Insufficient support from supply chain partners (suppliers and distributors).
- Intense market competition pressures.
- Organizational culture constraints.
- Limited government assistance.

These barriers indicate that the success of ISO 9001 implementation in food SMEs depends not only on internal organizational commitment but also on external enabling factors such as infrastructure, regulatory frameworks, and broader business ecosystems. Without more substantial synergies among SMEs, supply chain partners, and active government involvement, the process of quality improvement and competitiveness enhancement is likely to progress slowly. Therefore, collaborative strategies and sustained policy support are essential for overcoming these challenges.

The main challenges of ISO 9001 adoption among Indonesian food SMEs include management support, external bureaucracy, and technical limitations, as summarized in Figure 2. However, notable variations were observed in financial constraints, human resource competencies, and employee resistance across cases. These results affirm that the success of ISO 9001 implementation is shaped not only by the standard itself but also by each SME's internal context and the external environment in which it operates.

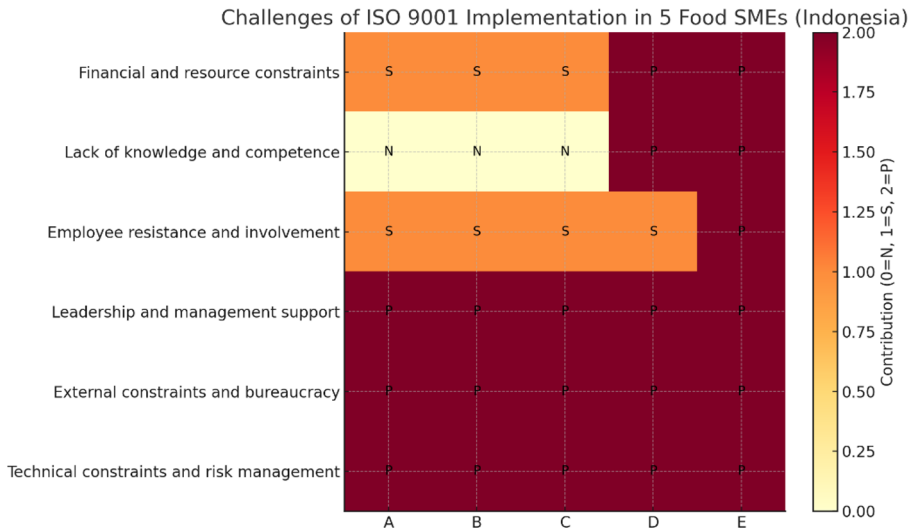


Fig. 2. Heatmap of ISO 9001 challenges reported by five food SMEs in Indonesia

Consistent with earlier studies, the findings confirm that the most persistent barriers involve top management commitment, bureaucratic regulations, and limitations in technical and risk management [10]. ISO 9001 adoption is unlikely to succeed without strong managerial commitment, and excessive bureaucracy coupled with limited technical capacity often acts as a significant obstacle for SMEs. Financial and resource constraints also emerged as significant challenges, particularly for SMEs with limited capital. Meanwhile, employee resistance and skills gaps were more variable across cases, reflecting the influence of organizational culture and the effectiveness of training programs [14]. Without effective change management, ISO 9001 risks being perceived as an additional burden rather than as a tool for improvement.

Beyond these six core challenges, SMEs reported additional barriers, including high certification maintenance costs (periodic audits, product testing, training, and system updates), limited digital technology adoption, weak supply chain support, intensified market competition, cultural constraints, and insufficient government assistance. These findings highlight that ISO 9001 implementation is not solely an internal challenge but also deeply embedded within broader structural and systemic factors [3]. Addressing these challenges requires a systemic, collaborative approach that involves not only SMEs but also supply chain partners, certification bodies, and government institutions. Sustained policy support, targeted capacity-building programs, and stronger collaboration across stakeholders are essential to create a supportive ecosystem that enables food SMEs to maximize the benefits of ISO 9001.

3.4 Implications, Limitations, and Future Research Agenda

Implementing ISO 9001 in Indonesian food SMEs delivers tangible benefits in product quality, customer satisfaction, and organizational reputation. At the same time, it poses

significant challenges, particularly in terms of management support, bureaucratic hurdles, and technical limitations. Policy interventions should therefore focus on two key areas: (1) strengthening the internal capacities of SMEs through training, digitalization, and effective change management, and (2) simplifying regulations and offering financial incentives to reduce the certification burden. ISO 9001 should not be perceived merely as a formal requirement but as a strategic instrument for sustaining competitiveness within Indonesia's food SME sector.

This study is not without limitations. The analysis was based on case studies from food SMEs, and further research should include a broader range of SMEs across different sectors. Moreover, longitudinal and comparative studies would be valuable for assessing the long-term impacts and comparing strategies between certified and non-certified SMEs.

4 Conclusion

This study concludes that ISO 9001 implementation in food SMEs in Indonesia offers significant benefits, including improved quality, customer satisfaction, and organizational reputation, while also contributing to efficiency, market access, and long-term strategic transformation. However, its effectiveness is constrained by limited management support, bureaucratic barriers, financial and technical challenges, and insufficient workforce competencies. To maximize impact, SMEs should strengthen managerial commitment, invest in capacity-building, and adopt digital tools. At the same time, government agencies and supporting institutions should streamline regulations, offer financial incentives, and provide technical assistance to ensure sustainable adoption of ISO 9001 among SMEs.

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The data used to support the findings of this study are available from the corresponding author upon reasonable request.

Danar Agus Susanto contributed to conceptualization, methodology development, data analysis, and manuscript preparation. Mokh Suef was responsible for supervision, research design validation, and critical revision of the manuscript. Putu Dana Karningsih contributed to methodological refinement and validation of analyses. Bambang Prasetya contributed to data interpretation and review of the final manuscript. All authors have read and approved the final version of the manuscript.

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