

Implementing ISO 31000:2018 for Enterprise Risk Management in MSMEs: Evidence from Purworejo Regency, Indonesia

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ABSTRACT

Purworejo Regency, Indonesia, has more than 54,000 micro, small, and medium enterprises (MSMEs). Local institutions, including the MSME Forum and cooperatives, support MSME development, yet many MSMEs manage uncertainty S. (2026). Implementing ISO 31000:2018 informally without systematic planning or for enterprise risk management in MSMEs: risk documentation. This study assesses Evidence from Purworejo Regency, Enterprise Risk Management (ERM) Indonesia. *International Journal of Accounting and Finance in Asia Pacific*, 9(3), 932-950. Organization for Standardization (ISO) 31000:2018 and identifies risk-treatment priorities. A sequential explanatory mixed-methods design was used. Quantitative assessment of 125 active MSMEs registered with the Purworejo Regency MSME Forum used a likelihood-impact matrix, followed by qualitative interviews, observations, discussions, and document review. Twelve risks were identified across financial, operational, human-resource, and strategic categories. Three strategic risks received scores of 25 (Very High): D1 (lack of a business plan), D2 (lack of a business development plan), and D3 (lack of business strategy). D4 (lack of risk mitigation) scored 15 (High), while limited capital (A1) and decreased production (B3) scored 12 (Moderate). The findings prioritize strategic planning, managerial capability, risk documentation, stakeholder consultation, and periodic monitoring to support MSME resilience and sustainability.

Keywords: Business Sustainability; Enterprise Risk Management; Micro, Small, and Medium Enterprises; Risk Assessment; Risk Management

JEL Classification: D81; G32; M21

INTRODUCTION

Globalization, digital transformation, climate change, supply-chain disruption, and economic pressure have increased organizations' exposure to interconnected risks. Risk management has consequently evolved from a control-oriented activity into a component of governance and strategic decision-making that supports organizational resilience and value creation (Ansyari, 2024; Glette-Iversen et al., 2023). For MSMEs, this shift is particularly important because their smaller resource base and owner-centered decision structures can make them more sensitive to disruptions. MSMEs contribute substantially to employment, income generation, innovation, and poverty reduction, but their limited financial resources, managerial capability, technology adoption, and access to finance can increase vulnerability to business risks (Ahmad & Teo, 2024; Evinita et al., 2025; Hoang et al., 2025; Vy et al., 2025).

Indonesia has more than 65 million micro, small, and medium enterprises (MSMEs), which contribute approximately 61% of national gross domestic product and absorb around 97% of employment (Coordinating Ministry for Economic Affairs Republic of Indonesia, 2023). Despite this contribution, many MSMEs continue to rely on informal and reactive risk practices. Risk-related decisions are often based on owner experience, while financial records, written plans, and systematic review may be limited. These constraints can make it difficult to anticipate disruptions, compare alternative responses, and coordinate decisions across finance, operations, human resources, and strategy (Santoso et al., 2025; Ulupui et al., 2024; Widayastuti et al., 2025).

The International Organization for Standardization (ISO) issued ISO 31000:2018 as a flexible framework that integrates risk management into organizational activities through establishing context, risk identification, risk analysis, risk evaluation, risk treatment, recording and reporting, communication and consultation, and monitoring and review (ISO, 2018). Its emphasis on integration, continual improvement, and decision-making makes it suitable for organizations that need a systematic process without necessarily adopting the complexity of large-corporate risk systems. Studies of small and medium-sized enterprises indicate that risk-management adoption is shaped by managerial knowledge, accounting practices, governance, and sustainability considerations (Prasetyo & Gunawan, 2026), while empirical research links structured risk management with resilience and sustainability outcomes (Monazzam & Crawford, 2024; Setjoatmadja et al., 2025).

Purworejo Regency, Central Java, provides an appropriate setting because MSMEs dominate local economic activity while many remain small-scale enterprises with limited finance, managerial capability, and systematic risk management. Existing studies commonly examine selected risk types, individual cases, or adoption determinants rather than the implementation of the complete ISO 31000:2018 process across multiple MSMEs. This study addresses that gap by assessing the full process among 125 MSMEs in Purworejo Regency. The objective is to identify and classify the risks faced by MSMEs, examine how ISO 31000:2018 processes are implemented in practice, and formulate risk-treatment priorities. The significance lies in translating a general risk-management standard into a practical MSME-oriented assessment. Its novelty is the process-based integration of risk identification, likelihood-impact evaluation, treatment, documentation, consultation, and monitoring within a single empirical setting. The contribution is both analytical, by showing the relative priority of risk categories and individual risks, and practical, by providing a framework that MSME owners and supporting institutions can use to strengthen resilience and business sustainability.

LITERATURE REVIEW

Enterprise Risk Management: Conceptual Development and Theoretical Perspectives

Enterprise risk management (ERM) developed as an integrated alternative to traditional approaches that manage risks separately and may overlook interrelationships among risk sources. ERM positions risk management within strategy, governance, and routine decision-making rather than treating each risk as an isolated control issue. This integrated perspective is especially relevant when one weakness, such as limited planning, can influence financing, production, staffing, and market decisions (Crawford & Jabbour, 2024; Dahmen, 2023; Monazzam & Crawford, 2024).

Enterprise Risk Management in Micro, Small, Medium-Sized Enterprises

MSMEs face distinctive constraints in implementing ERM. Systematic reviews and empirical studies point to limited financial resources, informal procedures, weak documentation, limited specialist expertise, and dependence on owner-manager knowledge as recurring barriers (Ahmad & Teo, 2024; Mthiyane et al., 2022; Yuwono & Rachmawati, 2024). Recent Indonesian evidence further indicates that risk-management adoption is associated with knowledge, accounting, governance, sustainability, and owner-related motivations (Prasetyo & Gunawan, 2026). In addition, risk management has been linked to business resilience and sustainability, suggesting that risk processes should be designed not only to prevent losses but also to improve the organization's capacity to adapt (Setjoatmadja et al., 2025; Ulupui et al., 2024). Case studies of Indonesian MSMEs similarly demonstrate the usefulness of structured risk identification, assessment, and treatment for operational continuity (Dewi & Ilham, 2023; Dvorsky et al., 2021; Haryani et al., 2022; Jesslyn et al., 2022; Jikrillah et al., 2021; Saifulloh et al., 2023; Santana et al., 2023).

Implementing ERM in MSMEs requires an approach tailored to the organization's characteristics, particularly limited resources, simple organizational structures, and owner-centered decision-making. Financial management is an important part of this adaptation because weak financial information can constrain planning and financing decisions (Nkwinika & Akinola, 2023). Recent research also connects risk management with technology adoption, business growth, and sustainability, indicating that risk processes should be integrated with broader managerial capabilities rather than treated as isolated controls (Judijanto et al., 2025; Setiawati & Mastarida, 2024). Therefore, MSME-oriented ERM needs to be systematic enough to reveal priorities but simple enough to be incorporated into everyday management.

ISO 31000:2018 as Enterprise Risk Management Framework

ISO 31000:2018 is particularly useful when risk management must be integrated with strategy rather than handled as an isolated control function. Risk analysis combines the likelihood of an event with its potential impact, while risk evaluation translates the resulting score into a priority for action. This logic is consistent with the broader ERM literature emphasizing the strategic role of risk information in managerial judgment and organizational resilience (Crawford & Jabbour, 2024; Hristov et al., 2024; Ulupui et al., 2024). In the Indonesian MSME context, financial management and access to finance are also closely connected to business continuity, making financial and strategic risks important components of an integrated assessment (Mugiati, 2024; Widyastuti et al., 2025).

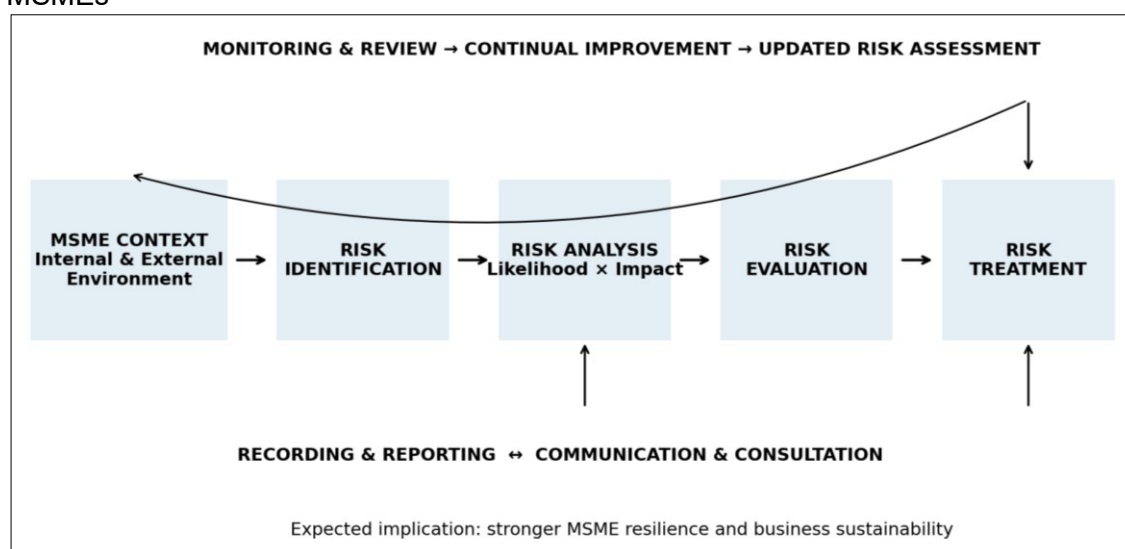
The ISO 31000 process has been applied in different organizational contexts and is useful for identifying, analyzing, evaluating, and treating risks in a structured sequence. Recent work on dynamic ERM also emphasizes the importance of updating risk

assessments as conditions change (Glette-Iversen et al., 2023; Zhu et al., 2023). The present study therefore treats ISO 31000:2018 as a process rather than a checklist: establishing context clarifies the business environment and objectives; risk identification captures sources of uncertainty; risk analysis quantifies likelihood and impact; risk evaluation determines priority; risk treatment specifies responses; recording and reporting preserve organizational knowledge; communication and consultation broaden the information base; and monitoring and review provide feedback for continual improvement.

Conceptual Framework

The conceptual framework links the ISO 31000:2018 process to the empirical assessment of MSME risk management. It begins with the internal and external business context, proceeds through risk identification, likelihood-impact analysis, risk evaluation, and treatment, and is supported by recording and reporting, communication and consultation, and monitoring and review. Figure 1 illustrates how these connected activities translate dispersed business risks into prioritized managerial actions and a continuing feedback loop for organizational learning and business sustainability.

Figure 1. Conceptual Framework of ISO 31000:2018 Implementation Assessment in MSMEs



Source: Adapted from International Organization for Standardization (ISO), ISO 31000:2018, Risk management—Guidelines (2018).

RESEARCH METHOD

This study employed a mixed-methods approach using a sequential explanatory design. The quantitative phase was conducted first to identify and prioritize risks across the participating MSMEs, followed by qualitative inquiry to explain the patterns observed in the quantitative assessment. The design was selected because numerical risk scores indicate priority but do not, by themselves, explain why risks arise or why particular risk-management practices remain informal. The qualitative phase therefore provided contextual interpretation of the quantitative results.

Research Approach and Design

The study used a sequential explanatory mixed-methods design. The quantitative phase assessed risks among 125 active MSMEs registered with the Purworejo Regency MSME Forum. The qualitative phase drew on purposively selected participants with direct involvement in business decisions and risk management, using in-depth interviews, field

observations, discussions, and available business documents to contextualize the quantitative priorities. Integration occurred at the interpretation stage: quantitative risk scores established priorities, while qualitative evidence was used to explain the managerial conditions underlying those priorities.

Population and Sampling

The study population comprised MSMEs operating in Purworejo Regency. Purposive sampling was used because the study required enterprises that could provide current information about business risks and management practices. The inclusion criteria were active operation, ongoing production or business activity, and willingness to participate. A total of 125 MSMEs meeting these criteria participated in the quantitative phase.

Data Collection

Primary data were collected through structured questionnaires, in-depth interviews, observations, and discussions with MSME owners. The questionnaire generated the likelihood and impact assessments, while interviews and observations were used to identify risk sources, understand current management responses, and assess documentation, communication, and monitoring practices. The identities and information of MSMEs are kept confidential and used solely for research purposes.

Risk assessment followed the ISO 31000:2018 process. Risk identification classified risks into financial, operational, human-resource, and strategic groups. Each identified risk was assessed on two dimensions: likelihood of occurrence and impact. Both dimensions used a five-point scale. The likelihood scale ranged from 1 (very rarely) to 5 (almost certain), while the impact scale ranged from 1 (insignificant) to 5 (catastrophic). The risk score was calculated by multiplying the likelihood and impact ratings (score = likelihood × impact). Scores of 1–4 were classified as Very Low, 5–9 as Low, 10–14 as Moderate, 15–19 as High, and 20–25 as Very High. Risks classified as Moderate or above were treated as priorities for management attention.

Data Analysis

Quantitative analysis consisted of frequency tabulation and matrix mapping. The results were then used to identify the risks requiring treatment and to formulate mitigation strategies. Qualitative data were analyzed thematically by comparing recurring evidence from interviews, observations, discussions, and documents. Thematic analysis focused on managerial planning, financial practices, operational continuity, and communication/documentation of risk. The qualitative findings were used to explain the quantitative priorities rather than to generate a separate set of risk scores. Integration of the two strands was achieved by comparing high-priority risks with the observed managerial practices and proposed treatment actions.

RESULTS

Establishment of Context

Establishing context is the initial stage of ISO 31000:2018 and provides the basis for interpreting the risks identified in the subsequent assessment. The participating MSMEs were operating businesses with an immediate objective of maintaining continuity, product quality, and income generation. The qualitative evidence indicated that owners generally understood the practical environment in which they operated and had received some risk-related or entrepreneurship training. However, risk management was still largely embedded in routine owner decisions rather than documented as a formal management process. The separation of personal and business finances reported by many owners suggests progress in financial discipline, but this practice was not

consistently accompanied by formal risk registers, written business plans, or documented mitigation procedures.

Risk Assessment

Risk Identification

Risk identification generated 12 risks grouped into four categories: financial, operational, human-resource, and strategic. Financial risks included limited capital, difficulty accessing additional funding, non-standardized financial reporting, and failure to separate personal and business finances. Operational risks comprised difficulty obtaining raw materials, unstable raw-material prices, and decreased production. Human-resource risk was represented by high labor turnover. Strategic risks comprised lack of a business plan, lack of a business development plan, lack of business strategy, and lack of risk mitigation. The classification shows that the risk profile extends beyond immediate financial constraints and includes planning and governance practices that influence the capacity of MSMEs to respond to uncertainty.

Table 1. Risk Identification

Risk Type	No.	Risk	Risk Source/Cause
Financial Risk	A1	Limited capital	Business is run with personal money.
	A2	Experiencing difficulties in accessing funding sources when in need of additional capital.	MSMEs are not bankable.
	A3	Not using standardized financial reports.	Do not have sufficient knowledge of financial statements.
			It's a hassle to create financial reports.
	A4	Not separating personal finances from business finances.	Did not use a business financial report.
Operational Risk	B1	Difficulties in obtaining raw materials.	Limited supply from suppliers.
	B2	Unstable raw material prices.	The market price of raw materials has increased.
			Raw material scarcity.
	B3	Decreased production.	Less public consumption.
Human Resource Risk	C1	High labor turnover.	Not satisfied with the salary.
			Uncomfortable with the work environment.
			High workload.
Strategic Risk	D1	Lack of business plan.	Running businesses without business planning and strategy.
	D2	Lack of business development plan.	
	D3	Lack of business strategy.	
	D4	Lack of risk mitigation.	

Table 1 shows that the twelve identified risks span financial, operational, human-resource, and strategic domains. Financial risks concern capital and financial records; operational risks concern raw-material access, price instability, and production decline; the human-resource risk concerns labor turnover; and strategic risks concern business planning, development, strategy, and mitigation. The accompanying qualitative material indicates that owners often rely on experience when making decisions about production, financing, and business development.

Risk Analysis

Risk analysis combined likelihood and impact using a 5×5 matrix. Likelihood was assessed from 1 (very rarely) to 5 (almost certain), and impact from 1 (insignificant) to 5 (catastrophic). The resulting matrix provides a common numerical basis for comparing risks that differ in nature. The scoring system is important because the same risk category may contain items with different priorities; therefore, treatment decisions were based on the individual risk score rather than on category labels alone. The following table presents the categorization of risk likelihood (frequency) and the impact should the risk occur.

Table 2. Likelihood and Impact Rating Scales

Frequency of occurrence			Impact caused	
Value	Description		Value	Description
1	Very Rarely	<10%	1	Not Significant
2	Infrequently	10%<p<40%	2	Minor
3	Possible	40%<p<60%	3	Moderate
4	Most likely	60%<p<80%	4	Large
5	Almost certain	>80%	5	Catastrophe

Table 2 defines the five-point likelihood and impact scales used in the assessment. The likelihood scale ranges from very rare to almost certain, while the impact scale ranges from insignificant to catastrophic; these ratings are multiplied to produce each risk score.

Table 3 outlines the 5×5 risk analysis matrix used to assess and classify risks based on their likelihood of occurrence and severity of impact. Likelihood is rated on a scale of 1 (Very rarely) to 5 (Almost certain), while severity ranges from 1 (Insignificant) to 5 (Catastrophe).

Table 3. Likelihood-Impact Matrix: Risk Score and Risk Level

Risk Analysis Matrix 5x5			Severity				
			1	2	3	4	5
			Insignificant	Minor	Moderate	Big	Catastrophe
Likelihood	5	Almost certain	5 Low	10 Moderate	15 High	20 Very High	25 Very High
	4	Most likely	4 Very Low	8 Low	12 Moderate	16 High	20 Very High
	3	Possible	3 Very Low	6 Low	9 Low	12 Moderate	15 High
	2	Infrequently	2 Very Low	4 Very Low	6 Low	8 Low	10 Moderate
	1	Very rarely	1 Very Low	2 Very Low	3 Very Low	4 Very Low	5 Low

Table 3 shows that the risk score is calculated by multiplying the likelihood score by the severity score, resulting in a risk level ranging from Very Low to Very High. Applying the multiplication rule consistently places scores of 20–25 in the Very High range, 15–19 in the High range, 10–14 in the Moderate range, 5–9 in the Low range, and 1–4 in the Very Low range. The matrix provides a systematic basis for comparing risks and determining their relative priorities for risk mitigation. Risks with higher scores require greater attention and more urgent mitigation measures than those with lower scores.

Risk Evaluation

Risk evaluation translates the numerical scores into standardized management priorities. In the revised classification, scores of 1–4 are Very Low, 5–9 Low, 10–14 Moderate, 15–19 High, and 20–25 Very High. This classification is applied consistently across the risk-

evaluation table, matrix mapping, and treatment recommendations. The classification emphasizes that risk priority depends on the combined likelihood and impact rather than on the perceived seriousness of a risk category alone.

Table 4. Risk Evaluation by Identified Risk

Risk Type	No.	Risk	Frequency	Impact	Risk Magnitude	Risk Evaluation	Need risk management? (yes/no)
Financial Risk	A1	Limited capital	4	3	12	Moderate	Yes
	A2	Experiencing difficulties in accessing funding sources when in need of additional capital.	3	3	9	Low	No
	A3	Not using standardized financial reports.	2	4	8	Low	No
	A4	Not separating personal finances from business finances.	2	4	8	Low	No
Operational Risk	B1	Difficulties in obtaining raw materials.	2	1	2	Very Low	No
	B2	Unstable raw material prices.	2	2	4	Very Low	No
	B3	Decreased production.	4	3	12	Moderate	Yes
Human Resource Risk	C1	High labor turnover.	4	2	8	Low	No
Strategic Risk	D1	Lack of business plan.	5	5	25	Very High	Yes
	D2	Lack of business development plan.	5	5	25	Very High	Yes
	D3	Lack of business strategy.	5	5	25	Very High	Yes
	D4	Lack of risk mitigation.	3	5	15	High	Yes

Table 4 shows that D1, D2, and D3 each scored 25 (Very High); D4 scored 15 (High); A1 and B3 each scored 12 (Moderate); and the remaining six risks scored below 10 and were classified as Low or Very Low. The risk levels are consistent with the likelihood-impact scores and standardized thresholds. This distribution indicates that strategic planning and risk mitigation require the most immediate management attention.

Table 5. Risk Distribution Matrix

Risk Analysis Matrix 5x5			Severity				
			1	2	3	4	5
			Insignificant	Minor	Moderate	Big	Catastrophe
Likelihood	5	Almost certain					D1, D2, D3
	4	Most likely		C1	A1, B3		
	3	Possible			A2		D4
	2	Infrequently	B1	B2		A3, A4	
	1	Very rarely					

Table 5 illustrates the distribution of identified risks across the 5×5 risk matrix based on their likelihood of occurrence and severity of impact. The risks are represented by codes A1–A4, B1–B3, C1, and D1–D4, with each code positioned according to its respective likelihood and severity ratings. The distribution shows that D1, D2, and D3 occupy the highest likelihood category (Almost certain) and the highest severity category (Catastrophe), indicating that these risks warrant particular attention. Other risks are distributed across lower likelihood levels and varying degrees of severity. This matrix provides an overview of the relative positions of the identified risks and supports the prioritization of risk management actions according to their assessed likelihood and impact. The map is consistent with the scores reported in **Table 4**.

Risk Treatment

Risk treatment was formulated according to the standardized risk level. Very High and High risks require direct attention and structured action; Moderate risks require defined procedures and monitoring; and Low or Very Low risks can generally be managed through routine controls and periodic review. Treatment therefore focuses on reducing either the likelihood of occurrence, the impact if the event occurs, or both. The proposed actions also recognize the resource constraints of MSMEs by emphasizing training, mentoring, simple documentation, financing access, and collaboration rather than complex risk-management systems.

Table 6. Management Action by Risk Level

No.	Risk Level	Management Action
1	Very Low and Low	Special treatment is unnecessary, as long as it is closely monitored to prevent any progression.
2	Moderate	A process must be developed for managing and overseeing the identified risks. Using the routine operating procedure and updating it is enough if there is already a standard operating procedure in place.
3	High	Requires attention from the director/highest management/owner.
4	Very High	The director or top management takes the lead in providing attention and direct handling, with detailed planning as support.

Table 6 links each risk level to an appropriate management response. Very High risks require direct owner or top-management attention; High risks require focused action; Moderate risks need defined procedures and oversight; and Low or Very Low risks can be managed through routine controls and monitoring.

Table 7. Risk Treatment Plan

Risk Level	No.	Risk	Strategy	Strategy Description	Who's involved?
Very High	D1	Lack of business plan	Sharing	Participate in entrepreneurship training organized by the local government through the Cooperatives and MSMEs Office, or universities.	Business owner. The Department of Cooperatives and MSMEs Office, or universities.
				Changing mindset: the need for a business plan.	
				Assistance in preparing a business plan.	
	D2	Lack of business development plan	Sharing	Participate in entrepreneurship training organized by the local government through the Cooperatives and MSMEs Office, or universities.	Business owner. The Department of Cooperatives and MSMEs Office, or universities.
				Changing mindset: the need for a business development plan.	
				Assistance in preparing business development plans.	
	D3	Lack of business strategy	Sharing	Changing mindsets: the need for a business strategy.	Business owner. The Department of Cooperatives and MSMEs Office, or universities.
				Assistance in creating a business strategy.	
High	A1	Limited capital	Sharing	Borrow from authorized and incorporated financial institutions.	Business owner. Financial institutions.
				Consistently raise capital from retained earnings.	
	B3	Decreased production	Mitigate or reduce risk	Anticipate production decline by managing capital that will be used for production so as not to be constrained in production.	Business owner. Supplier.
	C1	High labor turnover	Mitigate and reduce risk	Build and strengthen a family culture.	Business owner.
				Provides sufficient flexibility for employees.	
	D4	Lack of risk mitigation	Mitigate and Reduce Risk	Change the mindset: the need to mitigate or prevent business risks.	Business owner. The Department of Cooperatives and MSMEs Office, or universities.
				Assistance with risk mitigation (identification, risk assessment, and risk strategies).	

Low	A2	Experiencing difficulties in accessing funding sources when in need of additional capital	Sharing	Utilize government credit for MSMEs.	Business owner. The Department of Cooperatives and MSMEs Office, or universities.
				Socialization of financial institutions on credit for MSMEs.	
	A3	Not producing standardized financial reports	Sharing	Participated in training organized by the Cooperatives and MSMEs Office on financial reporting.	Business owner. The Department of Cooperatives and MSMEs Office, or universities.
				Community service (lecturers and students) to MSMEs regarding business financial reports and their preparation.	
				Assistance in preparing business financial reports.	
	A4	Not separating personal finances from business finances	Mitigate and reduce risk	Create simple financial reports so that personal and business finances can be separated.	Business owner.
Very Low	B1	Difficulty in obtaining raw materials	Mitigate and Reduce Risk	Diversify raw-material sources beyond the local market and maintain a small list of alternative suppliers.	Business owner. Supplier.
	B2	Unstable raw material prices	Monitor	Monitor raw-material prices and adjust purchasing plans when material price changes may affect production costs.	Business owner. Supplier.

Table 7 shows that the most urgent intervention is strengthening managerial capacity rather than relying on a single financial instrument. The treatment plan links D1–D3 to business planning and strategic mentoring, D4 to routine risk identification and mitigation, A1 to working-capital planning and appropriate financing, and B3 to demand monitoring, production scheduling, and supplier coordination. The remaining risks can be managed through routine controls and periodic review.

Moderate risks require operational and financial controls that can be embedded in daily management. Limited capital can be addressed through more disciplined working-capital planning, appropriate formal financing, and retained-earnings policies. Decreased production requires demand monitoring, production scheduling, and supplier coordination. These measures complement broader findings that financial capability and access are important to MSME performance and sustainability (Mugiati, 2024; Widyastuti et al., 2025).

The treatment strategy also demonstrates that risk management in MSMEs can be strengthened through collaboration. Government agencies can provide training and financing information, financial institutions can improve access to appropriate products,

and universities can provide mentoring and simple risk-management tools. Such collaboration is particularly relevant where individual MSMEs lack the resources to employ specialist risk managers. The objective is not to reproduce the administrative complexity of large enterprises but to establish a practical cycle of identification, prioritization, action, and review.

Recording and Reporting

Recording and reporting remain relatively basic. The participating MSMEs generally maintained simple financial records, and many had begun separating personal and business finances, but risk information was rarely documented in a formal risk register. Risk identification, risk scores, treatment actions, and follow-up decisions were therefore not consistently preserved as organizational records. This limits the ability of owners to compare risk conditions over time and to learn systematically from previous disruptions.

A practical improvement is to introduce a one-page risk register containing the risk description, cause, likelihood, impact, score, treatment, responsible person, review date, and status. Such a tool would make ISO 31000:2018 more accessible to MSMEs while creating a documented basis for monitoring. The finding is also consistent with the broader evidence that smaller firms often require simplified and context-sensitive risk-management arrangements rather than complex systems designed for large organizations (Ahmad & Teo, 2024; Mthiyane et al., 2022).

Consultation and Communication

Communication and consultation were still dominated by business owners. The qualitative evidence indicates that risk-related decisions were often made internally, with limited systematic involvement of suppliers, employees, financial institutions, government agencies, or universities. This is important because several identified risks—particularly raw-material availability, financing, production decline, and employee turnover—are influenced by stakeholders outside the owner's direct control. Consultation can therefore broaden the information available for risk identification and improve the feasibility of treatment measures.

Based on the risk evaluation, the main recommendations are to institutionalize business planning, introduce simple risk documentation, strengthen financial management, improve access to appropriate financing, and establish periodic consultation and monitoring. These recommendations should be implemented incrementally so that risk management becomes part of normal managerial routines rather than an additional administrative burden.

Monitoring and Review

Monitoring and review are necessary to determine whether treatment measures remain appropriate as business conditions change. In the participating MSMEs, owners were the primary actors responsible for monitoring risk developments. However, the findings suggest that periodic external support could strengthen this process, particularly for strategic planning and financial management. Monitoring should therefore compare current risk scores with previous assessments and record whether mitigation actions have reduced likelihood, impact, or both.

A simple quarterly review can help MSMEs update their risk register, reassess the most important risks, and adjust treatment priorities. Government agencies and universities can support this process through periodic mentoring, while financial institutions and suppliers can contribute information on financing conditions and supply availability. Such a feedback mechanism is consistent with the continual-improvement orientation of ISO

31000:2018 and with the resilience perspective in recent MSME risk-management research (Monazzam & Crawford, 2024; Setjoatmadja et al., 2025).

Overall, the results show that ISO 31000:2018 can function as a practical organizing framework for MSMEs when its process is translated into simple managerial routines. The value of the framework lies not only in producing a risk score but in connecting the score to treatment, documentation, consultation, and review.

DISCUSSION

Strategic Risk Priorities

The findings provide three main insights into ERM implementation among MSMEs in Purworejo Regency. First, the most consequential exposure is strategic rather than purely operational or financial. Three strategic risks (lack of a business plan, lack of a business development plan, and lack of business strategy) received the maximum score of 25. This indicates that uncertainty is not only generated by external shocks; it can also arise from the absence of managerial mechanisms for anticipating and responding to change. The result is consistent with the ERM perspective that risk management becomes more valuable when integrated with strategic planning and managerial judgment (Crawford & Jabbour, 2024; Monazzam & Crawford, 2024; Ulupui et al., 2024). It also corresponds with recent evidence that knowledge, accounting, governance, and sustainability motivations influence risk-management adoption in Indonesian SMEs (Darmansyah et al., 2024; Prasetyo & Gunawan, 2026).

Second, the risk profile illustrates the importance of viewing financial, operational, human-resource, and strategic risks as interconnected. Limited capital and decreased production were classified as Moderate, while labor turnover was Low. Although these risks have lower scores than the strategic risks, they can interact with strategic weaknesses. For example, an MSME without a business development plan may have difficulty planning financing needs, production capacity, or workforce requirements. Similarly, inadequate financial records may constrain access to formal financing even when the business itself is viable. This interconnectedness is central to ERM and distinguishes it from a fragmented approach that handles each risk separately (Dahmen, 2023; Mthiyane et al., 2022).

Formalization of ERM Practices

Third, the qualitative evidence explains why formal risk management remains limited even when owners recognize business risks. The participating MSMEs had practical knowledge of their operating environment, and some had received training, but much of the risk-management activity remained embedded in owner experience. This pattern is consistent with research showing that smaller firms often rely on informal processes and require an ERM approach adapted to their limited resources and simple organizational structures (Ahmad & Teo, 2024; Ulupui et al., 2024). The implication is that implementation should focus on usability: a short risk register, a regular review schedule, and clear treatment responsibilities may be more feasible than a complex corporate risk system.

The findings also extend the discussion of MSME resilience. Recent research links risk-management practices with resilience and business sustainability, suggesting that risk management should be understood as a capability for adaptation rather than only a mechanism for preventing losses (Adikaram & Surangi, 2025; Monazzam & Crawford, 2024; Setjoatmadja et al., 2025). In Purworejo, the recommended interventions—business planning, financial discipline, supplier coordination, employee management, stakeholder consultation, and monitoring—represent complementary capabilities. Their

combined function is to increase the ability of MSMEs to recognize changes early, mobilize resources, and maintain business continuity.

The practical contribution of the study is therefore a process-based implementation logic. The assessment begins with context, converts observed risks into comparable scores, identifies management priorities, and then links each priority to a feasible treatment and monitoring mechanism. This is important because the risk score alone does not improve performance. Its managerial value appears when owners use the score to decide what should be addressed immediately, what can be incorporated into routine procedures, and what should be monitored.

Stakeholder Collaboration and Monitoring

The findings further suggest a role for institutional collaboration. Government agencies can provide entrepreneurship and financial-management training; universities can provide mentoring, simple risk registers, and periodic assessment; financial institutions can support appropriate financing and financial literacy; and suppliers can contribute information that improves operational planning. This collaborative approach is consistent with evidence that financial inclusion and literacy are associated with MSME sustainability (Widyastuti et al., 2025) and with recent research emphasizing financial-management and risk-management capabilities among Indonesian MSMEs (Sumampouw & Lonto, 2026; Widyastuti et al., 2025).

The study also contributes to the empirical application of ISO 31000:2018 in a multi-MSME local context. Previous case studies have demonstrated how ISO 31000 can identify and prioritize risks in individual MSMEs (Dewi & Ilham, 2023; Santana et al., 2023), while broader ERM studies emphasize adoption determinants and organizational resilience. By combining 125 MSME assessments with qualitative explanation, this study shows how the same framework can be used to reveal a common strategic-management pattern across businesses rather than only an isolated case. The contribution is contextual rather than universal: the results identify priorities for Purworejo MSMEs and provide a practical model that can be tested in other local MSME populations.

MSME Implications

Finally, the study has implications for the design of MSME empowerment programs. Training programs should move beyond generic entrepreneurship topics and incorporate business planning, risk identification, financial reporting, financing readiness, and periodic risk review. Support should be sequenced around the risk priorities identified by the enterprise rather than delivered uniformly. Such an approach may increase the relevance of interventions and make risk management a continuing managerial practice. The expected implication is stronger organizational resilience and business sustainability, rather than a claim that ISO 31000 implementation alone guarantees improved performance.

An additional implication concerns the level of ERM maturity represented by the findings. The evidence suggests that the participating MSMEs are not starting from an absence of risk awareness; rather, they are operating at an informal stage in which risk management is embedded in routine decisions. Owners recognize financing constraints, demand changes, supplier problems, workforce issues, and planning needs, but these observations are not consistently converted into written risk information and periodic review. This distinction matters because formalization should not be interpreted as replacing experiential knowledge. Instead, ISO 31000:2018 can be used to make experiential knowledge more visible, comparable, and transferable within the business. A simple documentation process can preserve what owners already know while adding a systematic basis for prioritization and follow-up.

From a managerial perspective, the results suggest a staged implementation pathway. The first stage is to establish a simple business and risk context by defining objectives, critical activities, key resources, and stakeholders. The second stage is to maintain a short risk register and periodically score the most relevant risks using likelihood and impact. The third stage is to assign treatment responsibilities and review whether actions have been implemented. The fourth stage is to evaluate changes in risk scores and update plans. This sequence does not require a dedicated risk-management department and can be incorporated into monthly or quarterly management meetings. Such a staged approach is consistent with the need for adaptive and resource-sensitive ERM arrangements in SMEs (Ahmad & Teo, 2024; Mthiyane et al., 2022).

At the institutional level, the findings provide a basis for moving from generic MSME assistance toward risk-priority-based support. A government program can use the most common high-priority risks to design targeted modules on business planning and risk mitigation, while universities can complement these modules with mentoring and simple analytical tools. Financial institutions can support financing readiness by encouraging standardized financial records, and suppliers can participate in planning for raw-material availability and price changes. The resulting ecosystem approach is important because several risks identified in the study cannot be addressed by the MSME owner alone. The contribution of the study is therefore not limited to a risk ranking; it also provides a practical basis for coordinating the roles of actors around the MSME risk-management process.

CONCLUSION

This study assessed the implementation of Enterprise Risk Management based on ISO 31000:2018 among 125 MSMEs in Purworejo Regency. Twelve risks were identified across financial, operational, human-resource, and strategic categories. After standardizing the risk classification, three strategic risks (lack of business plan, lack of business development plan, and lack of business strategy) were classified as Very High with a score of 25. Lack of risk mitigation was classified as High with a score of 15, while limited capital and decreased production were Moderate with scores of 12. The remaining risks were classified as Low or Very Low.

The results indicate that the central challenge is not simply exposure to financial or operational disruptions but the limited institutionalization of strategic risk management. Qualitative evidence shows that many risk decisions remain based on owner experience, while formal documentation, consultation, and periodic review are still developing. ISO 31000:2018 provides a useful process for converting these informal practices into a structured cycle of context establishment, assessment, treatment, documentation, communication, and monitoring.

The practical implication is that MSME resilience can be strengthened through feasible risk-management practices: written business and development plans, simple risk registers, improved financial records, appropriate financing access, supplier and production planning, employee-management practices, stakeholder consultation, and periodic review. The expected contribution of these practices is improved preparedness and adaptive capacity, which may support business sustainability. The study therefore contributes an empirically grounded, MSME-oriented application of ISO 31000:2018 in a local Indonesian context.

LIMITATION

This study has several limitations. First, the purposive sample of 125 MSMEs in Purworejo Regency limits statistical generalization to other regions or MSME populations. Second, likelihood and impact scores are based on respondent assessments and therefore may contain subjective judgment. Third, the study assesses risk-management implementation at one period and does not longitudinally test whether the recommended treatments reduce risk scores over time. Future studies can address these limitations through larger probability-based samples and longitudinal reassessment. Comparative studies across districts can also examine whether the strategic-risk pattern identified in Purworejo is replicated elsewhere.

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DECLARATION OF CONFLICTING INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the research reported in this article.

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