

The Implementation of Enterprise Risk Management (ERM) to Improve the Accuracy of Credit Decision-Making: A Case Study of Consumer Cooperative X – Savings and Loan Unit (USP) “Gajian di Muka” Product

Luri Rahman Anharudin, Ktut Silvanita Mangani, Wilson Rajagukguk

Universitas Kristen Indonesia

ABSTRACT

This study aims to analyse credit risk in Consumer Cooperative X, specifically within the Savings and Loan Unit (USP) for the “Gajian di Muka” product, by applying Enterprise Risk Management (ERM) based on ISO 31000:2018 through a Failure Mode and Effects Analysis (FMEA) approach. The background of this study is driven by the increasing ratio of non-performing loans (NPL) exceeding the cooperative’s tolerance threshold, as well as weaknesses in credit verification and monitoring processes that affect the accuracy of credit decision-making.

This research employs a descriptive qualitative method through in-depth interviews and document analysis to assess the severity, occurrence, and detection capability of credit risks. The root causes were identified using a fishbone diagram combined with the 5 Why approach, and subsequently analysed using FMEA to obtain the Risk Priority Number (RPN).

The findings indicate that several credit risks with high RPN values require priority mitigation, particularly those related to weaknesses in data verification, limited supervision, and the lack of an optimal early warning system. Following the implementation of ERM–FMEA-based mitigation strategies, credit risk can be controlled through improved operational procedures, strengthened verification systems, and the development of an early warning system. These findings demonstrate that the integration of ERM and FMEA is effective in enhancing early risk detection, reducing potential credit risk, and improving the accuracy of decision-making as well as the operational sustainability of the cooperative.

Keywords: Enterprise Risk Management (ERM), Failure Mode and Effects Analysis (FMEA), Credit Risk, ISO 31000:2018, Cooperative.

INTRODUCTION

Cooperatives represent one of the key pillars of the economic system, playing a significant role in enhancing community welfare through the principles of mutual cooperation and collectivism (Jalaludin, 2021). This is consistent with the fundamental objective of cooperatives, which is not solely profit-oriented but rather focused on fulfilling the collective needs of their members

(Parwata et al., 2020). In their development, cooperatives are not only engaged in the real sector but have also expanded into financial services through the establishment of Savings and Loan Units (USP), providing more accessible financing alternatives compared to conventional financial institutions.

One of the emerging service innovations is salary-based loan products such as “Gajian di Muka”, which offer convenient access to funds for employees prior to their payday. This product enhances members’ liquidity while also benefiting partner companies in managing cash flow. However, the ease of credit access also introduces increased credit risk, particularly the risk of default, which contributes to a rise in non-performing loans (NPL). Empirical data indicate that the NPL ratio in cooperatives has increased significantly, exceeding the established tolerance threshold, thereby reflecting weaknesses in credit risk management. This condition necessitates the implementation of a more effective and integrated risk management system to ensure the sustainability of cooperative operations.

Risk management plays a crucial role in maintaining organisational stability and performance, encompassing processes such as risk identification, analysis, evaluation, and control (Rizki et al., 2022). In this context, Enterprise Risk Management (ERM) serves as a comprehensive and integrated approach to managing organisational risks holistically (Grace et al., 2015). The implementation of ERM based on ISO 31000:2018 provides a systematic framework that enhances risk management effectiveness, strengthens organisational governance, and supports more accurate and strategic decision-making (Aisyah & Dahlia, 2022; Florio & Leoni, 2017).

Previous studies have demonstrated that the implementation of ERM can reduce credit default risk through improved credit procedures, enhanced supervision, and continuous performance evaluation (Inatura & Astari, 2024; Wahyuningsih, 2021; Mardiharjo, 2022; Elni et al., 2024; Sukma & Sujud, 2024). However, most studies have primarily focused on specific aspects of credit procedures or risk management, with limited research addressing the comprehensive implementation of ERM based on ISO 31000:2018, particularly in salary-based loan products that possess unique risk characteristics.

Therefore, this study is important in addressing this research gap by analysing the comprehensive implementation of ERM in identifying, evaluating, and mitigating credit risk in the “Gajian di Muka” product. It is expected that this research will contribute to the development of more effective credit risk management practices and support the operational sustainability of cooperatives.

LITERATURE REVIEW

Consumer Cooperatives and Savings and Loan Units (USP)

Consumer cooperatives are a type of cooperative that focuses on providing goods and/or services to meet the needs of their members. Under Indonesian regulations, cooperatives have

the flexibility to engage in various business activities in accordance with the needs and economic potential of their members, including expanding into financial services (Law No. 25 of 1992). One form of such business development is the provision of savings and loan services through the establishment of Savings and Loan Units (USP).

A USP is a business unit operated by non-savings and loan cooperatives to provide limited financing services to their members, as regulated under cooperative supervision policies (Regulation of the Minister of Cooperatives and SMEs No. 9 of 2020). The existence of a USP enables consumer cooperatives to perform dual functions simultaneously, namely as providers of consumer goods and as internal financing institutions for their members. Thus, the USP serves as a strategic instrument in enhancing access to financing that is more accessible, flexible, and membership-based.

Risk

Risk is the consequence of uncertainty in achieving objectives, which may result in either positive or negative impacts on an organisation (ISO 31000:2018). Risk is not only understood as the potential for loss but also as an opportunity arising from deviations from expected outcomes (Eko Sudarmanto et al., 2021; Syahputri & Kitri, 2020). In general, risk is closely associated with uncertainty and the likelihood of events that may affect the achievement of organisational objectives (Suhardjono, 2003; Vaughan, 1978). Therefore, risk measurement involves assessing both the probability of occurrence and the magnitude of impact (ISO 31000:2018).

Accordingly, the level of risk, or risk score, can be calculated using the following formula:
Table 1. Risk Matrix Formula

$$\text{Risk Score} = P \times D$$

Description:

P = Probability

D = Impact/Consequence

In the financial context, one of the most critical forms of risk is credit risk, defined as the risk of loss arising from a debtor's inability to fulfil payment obligations in accordance with the agreed terms (Altman, 1968). Credit risk can be classified into several types, including default risk, credit concentration risk, and liquidity risk, all of which may affect the financial stability of lending institutions (Kasmir, 2016).

Furthermore, credit risk is influenced by information asymmetry between lenders and borrowers. The Lemon Theory proposed by Akerlof explains that information imbalance makes it difficult to distinguish the quality of borrowers, thereby increasing the likelihood of default. This condition highlights the importance of credit assessment systems and the

utilisation of more comprehensive data to improve the accuracy of credit decision-making and minimise risk (Akerlof, 1970).

Risk Management

Risk management is a systematic process that encompasses the identification, analysis, evaluation, and control of risks in order to minimise negative impacts and maximise opportunities in achieving organisational objectives (Djohanputro, 2004). Through risk management, organisations are able to reduce uncertainties that may hinder goal attainment by managing risks in a structured and continuous manner.

According to ISO 31000:2018, the risk management process consists of five main stages, namely risk identification, risk analysis, risk evaluation or prioritisation, risk treatment, and risk monitoring and review. These stages are conducted sequentially and continuously to ensure that risks are managed effectively according to their level of priority. Risk identification aims to capture all potential risks, which are then analysed based on their probability and impact. Subsequently, risks are evaluated to determine their priority for treatment, followed by the selection of appropriate mitigation strategies such as risk avoidance, risk reduction, risk transfer, or risk acceptance. The final stage involves monitoring and reviewing risks to ensure the ongoing effectiveness of risk management practices (ISO 31000:2018).



Figure 1. Stages of Risk Management
Source: Stamatis (2019)

Enterprise Risk Management (ERM)

Enterprise Risk Management (ERM) is a comprehensive and integrated risk management approach used to manage various types of organisational risks, including credit, market, and operational risks, in order to maximise organisational value. Within the framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO), ERM is defined as a process involving management and all elements of the organisation to identify events that may affect the achievement of objectives and to provide reasonable assurance

regarding their attainment (COSO, 2004). ERM not only functions to minimise losses but also serves as a proactive strategy to enhance performance, innovation, and organisational value creation.

The effective implementation of ERM provides several benefits, including reducing unexpected disruptions, strengthening relationships with stakeholders, enhancing organisational reputation, and improving operational efficiency and productivity (KNKG, 2012; Citrawati Jatiningrum et al., 2021). Furthermore, ERM supports the achievement of organisational objectives through more systematic and integrated risk management practices. In its implementation, COSO-based ERM consists of eight main components, namely the internal environment, objective setting, event identification, risk assessment, risk response, control activities, information and communication, and monitoring. These components are interrelated and form a framework that enables organisations to manage risks in a comprehensive and sustainable manner (Soetedjo & Sugianto, 2018).

Ishikawa Diagram (Fishbone)

The Ishikawa diagram, also known as the fishbone diagram, is a visual tool used to systematically identify and organise potential causes of a problem (Ishikawa, 1986). This diagram helps break down complex problems into various categories of causes, thereby facilitating root cause analysis. Generally, causes are grouped into six categories known as the 6M: Man, Machine, Method, Material, Measurement, and Environment, which can be adapted to suit the organisational context (Stamatis, 2019).

The use of the Ishikawa diagram has proven effective in identifying the causes of both operational and credit risks, thereby supporting the formulation of more targeted corrective actions (Suparno et al., 2018; Setiawan & Kurniawan, 2021). To deepen root cause analysis, this diagram is often combined with the 5 Why Analysis, a technique that involves repeatedly asking “why” to uncover the underlying causes of a problem (Ohno, 1988). This method ensures that solutions address not only the symptoms but also the fundamental root causes (ASQ, n.d.).

The integration of the fishbone diagram and 5 Why Analysis is considered effective in strengthening the identification and validation of root causes, as well as supporting continuous improvement within organisations (Stamatis, 2019; Serrat, 2017; Imai, 1986). This approach is particularly relevant in the context of cooperatives, especially in identifying and mitigating credit risk more comprehensively.

Failure Mode and Effects Analysis (FMEA)

Failure Mode and Effects Analysis (FMEA) is a systematic and structured risk analysis method used to identify potential failure modes, analyse their causes and effects, and determine mitigation actions to minimise risk (Stamatis, 2003). This method was initially developed by the United States military and has since been widely adopted across various sectors, including finance and cooperatives (NASA, 2002).

FMEA aims to identify risks at an early stage, provide relevant information for decision-making, improve system reliability, and reduce the likelihood of recurring failures (Stamatis, 2003). The FMEA approach is inductive (bottom-up), starting with analysing system functions

or processes, identifying potential failure modes, and evaluating their causes, impacts, and detectability. In FMEA, each risk is assessed using three main parameters, namely Severity (S), Occurrence (O), and Detection (D), which are measured on a scale of 1 to 10 (AIAG, 2008).

Tabel 2. Severity Rating Scale for Credit Risk

Severity Rating	Description	Definition (Credit Risk Context)
10	Very High (Fatal)	Results in substantial losses, widespread defaults, liquidity crises, and disruption to cooperative operations.
8	High	Loan defaults affecting a large number of borrowers, leading to reduced profitability and restrictions on new lending.
6	Moderate	Significant payment delays (30–90 days) requiring special management intervention.
4	Low	Minor payment delays (less than 30 days), manageable through routine procedures.
2	Very Low	Minimal financial impact and does not affect operational activities.
1	Negligible	No significant impact on the cooperative's financial condition.

Source: Mascia et al. (2020)

Tabel 3. Occurrence Rating Scale for Credit Risk

Occurrence Rating	Description	Definition (Credit Risk Frequency)
10	Very Frequent	Occurs every month, with NPL increasing by more than 10% over several consecutive months.
8	Frequent	Occurs 5–10 times per year, for example when NPL remains stable within the range of 6–10%.
6	Moderately Frequent	Occurs 1–5 times per year, or when delay trends appear within a particular semester.
4	Rare	Occurs once per year, typically due to seasonal or situational factors.
2	Very Rare	Occurs only once in 5 years, usually due to exceptional circumstances.
1	Extremely Rare	Occurs once in 5–30 years, or has never occurred previously.

Source : A. Mascia, et al., (2020)

Tabel 4. Detection Rating Scale for Credit Risk

Detection Rating	Description	Definition (Credit Risk Detection Capability)
10	Very Difficult	The risk cannot be detected by any system; there is no data integration or membership validation process.
7	Difficult	Detected only through periodic manual audits; no automated notifications are available.
4	Moderately Easy	Can be detected through routine procedures or dashboards, but not in real time.
1	Very Easy	Can be detected immediately through automated systems, including integrated credit systems and member databases.

Source : A. Mascia, et al., (2020)

The Risk Priority Number (RPN) is then calculated as follows:

Table 5. Risk Priority Number (RPN) Formula

$$RPN = S \times O \times D$$

Description:

- S = Severity
- O = Occurrence
- D = Detection

Table 6. Classification of Risk Criticality Levels and RPN Action Responses

RPN	Criticality Level	Action
1 – 100	Low	Acceptable; the risk is relatively low and assigned a lower mitigation priority, with periodic monitoring required.
101 – 200	Moderate	Further analysis is required; minor corrective actions may be needed.
201 – 1000	High	Immediate corrective action is required.

Source : AIAG (2008)

The FMEA process begins with the identification of potential failures (*failure modes*), followed by an assessment using the parameters of Severity, Occurrence, and Detection. The Risk Priority Number (RPN) is then calculated to determine the priority level of risks. Risks with the highest RPN values are prioritised in the development of continuous mitigation strategies (AIAG, 2008).

5W1H Method

The 5W1H method is an analytical tool used to understand and describe a problem comprehensively through six fundamental questions: *what, where, when, who, which, and how*. This approach helps to identify various dimensions of a problem, enabling a deeper understanding that goes beyond symptoms to include context and root causes (Knop & Mielczarek, 2018). The core principle of this method emphasises that a well-defined problem is already half solved.

In practice, the 5W1H method is not only applied at the initial stage to understand a problem, but also during the development of improvement plans after root causes have been identified. Within the Quality Control Circle (QCC) approach, this method serves as a tool to formulate corrective actions that are systematic, measurable, and effectively implementable (Fatoni et al., 2022). Furthermore, within the frameworks of Lean and World Class Manufacturing (WCM), 5W1H is utilised as a formative tool to design targeted corrective actions based on actual conditions in the field (De Felice et al., 2013).

Thus, the 5W1H method is flexible and can be applied both in problem analysis and in solution development, thereby supporting continuous improvement processes and more effective decision-making.

RESEARCH METHODOLOGY

This study is a field research employing a descriptive qualitative approach aimed at gaining an in-depth understanding of credit risk and the implementation of Enterprise Risk Management (ERM) in Consumer Cooperative X. This approach was selected as it enables a comprehensive exploration of phenomena through narrative data, experiences, and interview findings (Moleong, 2007).

The research was conducted at Consumer Cooperative X using a purposive sampling technique involving board members, supervisors, managers, and USP staff who are directly involved in credit risk management. The data utilised consist of primary data obtained through in-depth interviews and secondary data derived from internal cooperative documents such as financial reports, credit data, and borrower histories (Sugiyono, 2017).

Data analysis was carried out using a qualitative approach with the Failure Mode and Effects Analysis (FMEA) method. Root cause identification was conducted using a fishbone diagram combined with the 5 Why approach. The identified risks were then analysed using FMEA to determine risk priorities based on the Risk Priority Number (RPN).

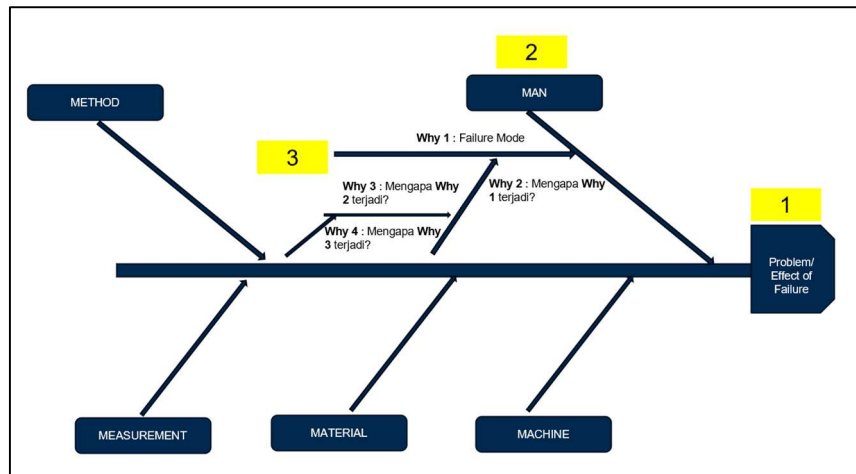


Figure 2. Fishbone Diagram: Stages in Identifying Failure Modes, Causes of Failure, and Effects of Failure

The risk measurement procedure in this study employs the Failure Mode and Effects Analysis (FMEA) method to identify potential failures in the credit disbursement process and to evaluate the level of risk generated. Risk assessment is conducted based on three main indicators, namely Severity (the level of impact), Occurrence (the frequency of occurrence), and Detection (the ability to detect risks). Each identified risk is assigned a score for each indicator, and the Risk Priority Number (RPN) is subsequently calculated.

The RPN value is used to determine the priority level of risks that require immediate attention. Severity is assessed based on the magnitude of financial losses (NPL) resulting from each *cause of failure*, calculated from the average loss relative to the number of affected members. Meanwhile, Occurrence is determined based on the frequency of risk events within a one-year

period using historical non-performing loan data. Detection is measured based on the cooperative's ability to identify risks, as perceived by respondents in terms of the speed of risk detection.

The resulting RPN values are then ranked to determine mitigation priorities, where risks with the highest values are given primary attention. To provide clearer guidance for action, the RPN values are classified into three categories: high, medium, and low risk. High-risk categories (RPN 81–125) require immediate mitigation, medium-risk categories (RPN 46–80) require further analysis, while low-risk categories (RPN 0–45) should still be monitored regularly.

Thus, the use of FMEA in this study serves not only as a risk prioritisation tool but also as a basis for determining appropriate mitigation strategies, ensuring that all identified risks are managed systematically and sustainably.

RESULTS AND DISCUSSION

Profile of Consumer Cooperative X and Business Process of the “Gajian di Muka” Product

The “Gajian di Muka” product is a short-term financing service provided by Consumer Cooperative X to meet members' immediate financial needs prior to their payday. This scheme is based on the projection of members' monthly income and is designed to provide quick liquidity without a complex credit approval process, provided that members meet the eligibility criteria.

This product operates under a business-to-business (B2B) partnership model between the cooperative and the companies where members are employed. Loan applications are submitted individually by members; however, the verification, disbursement, and repayment processes involve the company as an intermediary. Once approved, loan funds are disbursed to the member's account within a maximum of 1×24 working hours.

The main advantage of this product lies in its centralised repayment mechanism, whereby the cooperative issues billing to the partner company rather than directly to the member. The company subsequently deducts the repayment amount from the employee's salary in accordance with the agreed instalments. This mechanism accelerates the repayment process while simultaneously reducing the risk of default.

The “Gajian di Muka” product offers four loan ceiling options, namely IDR 500,000; IDR 1,000,000; IDR 1,500,000; and IDR 2,000,000. These limits are adjusted based on the member's remaining salary and repayment history. Administrative fees and service charges are applied proportionally according to the loan amount.

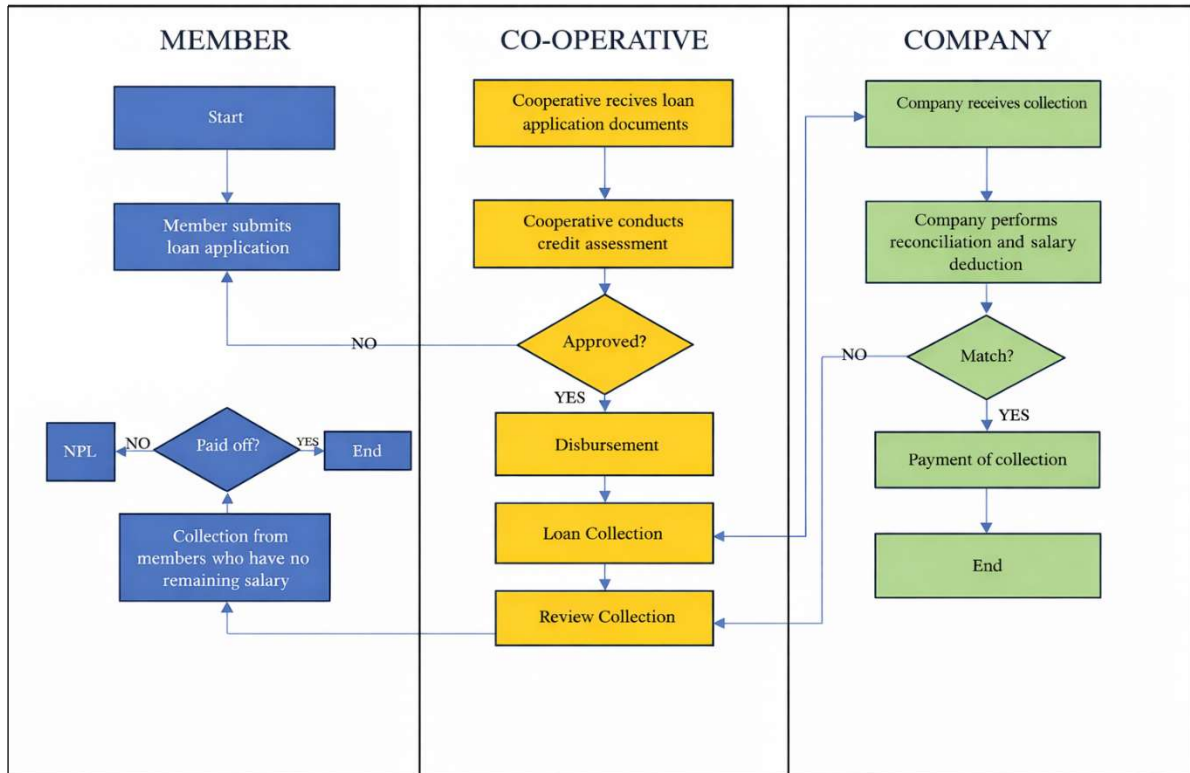


Figure 3. “Gajian di Muka” Business Process

Results and Discussion

This study employs a descriptive qualitative approach through in-depth interviews with six respondents who hold strategic and operational roles in the management of the Savings and Loan Unit (USP) of Consumer Cooperative X. The respondents consist of board members, supervisors, managers, and credit staff who are directly involved in the processes of credit approval, disbursement, and collection. The interview findings indicate that the increase in credit risk, particularly in the “Gajian di Muka” product, is influenced by delays in updating membership data from partner institutions, weak inter-unit coordination, and discrepancies between standard operating procedures (SOPs) and actual practices in the field. This condition suggests that the cooperative’s internal control system has not been functioning optimally.

From a financial performance perspective, the cooperative exhibited a significant growth trend from 2021 to 2023, followed by a decline in 2024. This is reflected in the development of assets, liabilities, and equity as shown below:

Table 7. Financial Position of Consumer Cooperative X (2021–2024)

Year	Total Assets	Total Liabilities	Total Equity
2021	4,861,547,895	4,567,685,669	293,862,226
2022	5,858,528,015	5,097,385,657	761,142,358
2023	9,770,608,549	8,525,592,096	1,245,016,454
2024	7,221,025,013	6,569,528,184	651,496,830

The increase in assets up to 2023 indicates an expansion in credit disbursement, particularly in the “Gajian di Muka” product. However, the decline in 2024 suggests a deterioration in asset quality due to the rising level of non-performing loans. This is further supported by the following financial ratio analysis:

Table 8. Financial Ratios of the Cooperative (2021–2024)

Rasio	2021	2022	2023	2024
Current Ratio	1,06	1,15	1,14	1,05
Debt to Asset	0,94	0,87	0,87	0,91
ROA	0,006	0,008	0,050	0,043

The liquidity ratio indicates a relatively stable condition, although it shows a declining trend in 2024. The high proportion of liabilities to assets reflects the cooperative’s dependence on members’ funds, which may increase liquidity risk. Meanwhile, profitability has declined due to the rising burden of credit risk.

The increase in credit risk is clearly reflected in the trend of Non-Performing Loans (NPL), which has risen significantly over the study period.

Table 9. NPL Development (2021–2024)

Year	Total Credit	Non-Performing Loans	NPL (%)
2021	3,498,000,000	34,000,000	0.97
2022	5,412,300,000	181,893,053	3.36
2023	7,500,650,000	615,394,565	8.21
2024	6,490,400,000	717,048,395	11.04

The data indicate that the NPL ratio increased more than tenfold over four years and has exceeded the cooperative’s tolerance threshold of 5%. This finding confirms the presence of weaknesses in the existing credit risk management system.

To identify the root causes of risk, this study employs a fishbone diagram approach combined with the 5-Why method. The analysis reveals that the primary contributing factors are associated with five aspects, namely human resources (*man*), methods (*method*), systems (*machine*), data (*material*), and measurement (*measurement*).

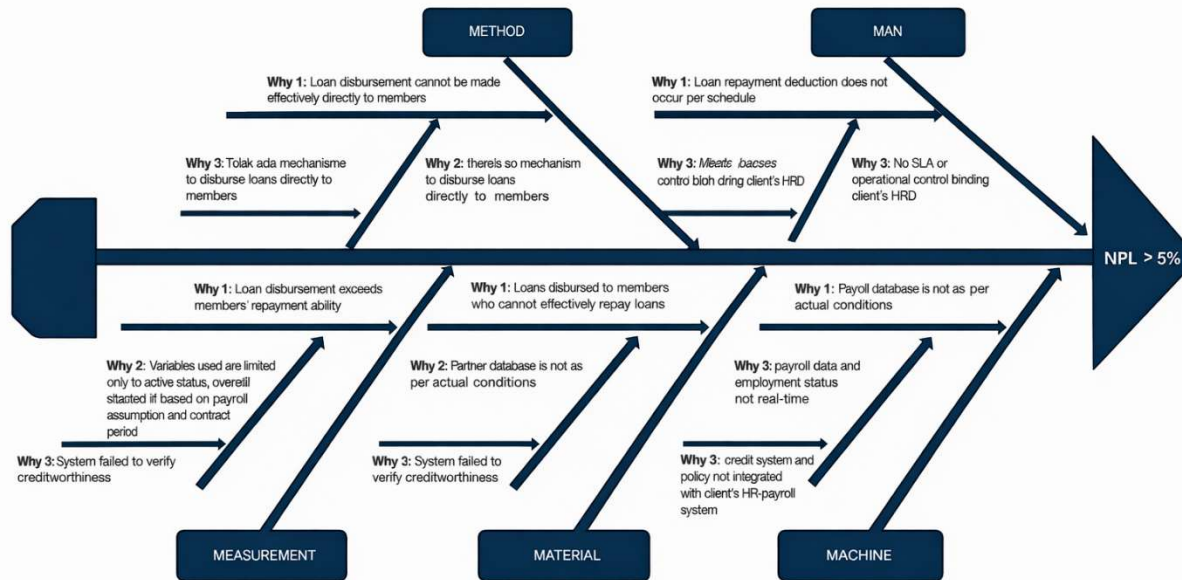


Figure 4. Fishbone Diagram

The visualisation of the diagram indicates that the main problems stem from inaccurate data, the lack of system integration with partner HR departments, weak collection procedures, and the absence of a standardised creditworthiness assessment system.

The results of the risk identification are summarised as follows:

Table 10. Summary of Risk Identification

Aspect	Failure Mode	Main Cause
Man	Failure in salary deduction	No Service Level Agreement (SLA)
Method	Ineffective collection process	No direct mechanism in place
Machine	Incorrect credit analysis	System not integrated
Material	Invalid data	Backdated updates
Measurement	Over-financing	No scoring system available

Subsequently, risk analysis was conducted using the FMEA method by calculating the Risk Priority Number (RPN) based on three main parameters, namely Severity, Occurrence, and Detection. The results indicate that the highest risk originates from the material aspect, specifically backdated data updates carried out by partner institutions, with an RPN value of 100. The next highest risks include the failure of the system to verify creditworthiness (RPN 80) and the absence of a Service Level Agreement (SLA) with partner HR departments (RPN 60).

Table 11. RPN Calculation Results

Risk	S	O	D	RPN
Backdated data	4	5	5	100
Failure in credit verification	4	4	5	80
Absence of SLA	3	4	5	60
System not integrated	5	2	5	50

The RPN values indicate that most risks exhibit high levels of severity and frequency, while detection capability remains low. This suggests that the cooperative does not yet have an adequate early warning system in place.

From a theoretical perspective, these findings are consistent with the concept of Enterprise Risk Management (ERM), which emphasises that risk management should be conducted in an integrated manner. However, in the context of Consumer Cooperative X, the implementation of ERM remains partial and unstructured. Furthermore, the increase in credit risk can also be explained through the Lemon Theory (Akerlof, 1970), which highlights the existence of information asymmetry between the cooperative and its members. Limited access to real-time data makes it difficult for the cooperative to accurately assess creditworthiness, thereby increasing the risks of adverse selection and moral hazard.

Moreover, the application of the FMEA method in this study has proven effective in providing a quantitative measurement of risk levels and assisting in determining mitigation priorities. Risks with the highest RPN values become the primary focus in the development of improvement strategies, which include system integration with partner institutions, strengthening credit verification mechanisms, establishing Service Level Agreements (SLAs), and developing technology-based control systems.

Overall, the findings of this study indicate that the increase in credit risk in Consumer Cooperative X is not solely caused by individual member factors, but also by weaknesses in systems, procedures, and risk governance that have not yet been fully integrated. Therefore, a transformation towards a more comprehensive, structured, and data-driven ERM-based risk management system is required to ensure the sustainability of the cooperative's financial performance.

CONCLUSION

The findings of this study indicate that the implementation of Enterprise Risk Management (ERM) in Consumer Cooperative X has not yet been fully integrated and remains largely administrative in nature. The risk management process is currently limited to the stages of identification and analysis, while risk evaluation and mitigation have not been conducted systematically. This condition has contributed to the increasing prominence of credit risk as the dominant risk, as reflected in the rise of the Non-Performing Loan (NPL) ratio from 0.97% to 11.04% over the period 2021–2024. Further analysis reveals that the primary causes of risk stem from weaknesses in systems and procedures, encompassing aspects of human resources, methods, systems, data, and measurement (5M). The implementation of integrated ERM based on ISO 31000, supported by the FMEA approach, has proven to enhance the effectiveness of risk control. In addition, the success of ERM implementation is strongly influenced by organisational risk culture and the commitment to applying good governance principles.

Based on these findings, the cooperative is recommended to strengthen its risk management system through the establishment of a dedicated risk management unit with a strategic role in organisational risk control. Furthermore, the development of an integrated risk information system in collaboration with partner companies is required to ensure real-time data validity. Enhancing human resource competencies through ERM and credit SOP training is also essential in fostering a strong risk culture. The FMEA method can be implemented as a periodic evaluation tool to monitor changes in risk levels, while the formulation of risk management policies and SOPs aligned with ISO 31000 is necessary to strengthen governance. In addition, improving coordination with partners and implementing continuous monitoring and evaluation are important steps in minimising credit risk in the future.

From an academic perspective, this study contributes to the development of the literature on ERM implementation in the cooperative sector by integrating ISO 31000, FMEA, and Fishbone Analysis approaches. Practically, this study provides an implementation guideline for cooperatives in managing credit risk in a more systematic and data-driven manner. The application of these findings is expected to enhance the financial resilience of cooperatives, strengthen member trust, and promote more transparent, accountable, and sustainable cooperative governance.

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