

Research Article

Building Digital Resilience: Exploring the Narratives of Micro-Entrepreneurs in Technology-Based Financial Transformation in Semarang City

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Abstract: This study focuses on designing a technology-based financial restructuring model to address the challenges faced by micro-enterprises in Semarang, particularly in financial management. Micro-enterprises play a vital role in the local economy but often struggle with liquidity issues, delayed payments, and weak receivable management, which increase their vulnerability to financial distress and potential bankruptcy. The research used a qualitative case study approach, combining in-depth interviews with 20 micro-entrepreneurs, five financial experts, participatory observations in 10 businesses, and three Focus Group Discussions (FGDs) involving entrepreneurs, fintech providers, and banking representatives. The data were analyzed using thematic coding, SWOT, and gap analysis to identify financial distress patterns and develop a restructuring prototype through design thinking. The results showed that 80% of MSMEs in Semarang face medium to high financial distress risk, with only 40% using digital tools for financial recording. The findings reveal a significant gap, as 60% of MSMEs still rely on manual methods. The study suggests that integrating basic financial applications and providing digital literacy training can enhance efficiency, decision-making, and resilience. The proposed financial restructuring model addresses both digital solutions and literacy barriers, ensuring practical adoption by micro-entrepreneurs.

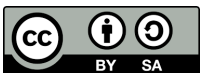
Keywords: Digital Financial Tools; Digital Literacy; Financial Distress; Financial Restructuring; Micro-enterprises.

1. Introduction

In the current digital era, micro-enterprises in Indonesia face significant challenges in financial management that can potentially lead to financial distress, particularly in Semarang, one of the economic centers in Central Java. Financial distress is a condition in which a company experiences liquidity problems that, if not promptly addressed, may result in bankruptcy (Platt & Platt, 2006; Surya, 2014). Data indicate that most MSMEs encounter financial difficulties within the first two years of operation, with a high failure rate (Ardiagarini, 2011).

Financial restructuring through the application of technology has become a potential solution to prevent financial distress. Anggita, Sunarmi, Azwar, and Sukarja (2023) state that restructuring is a strategic effort to strengthen companies experiencing decline so that they become efficient and competitive again. Sunarmi, Supriyadi, Guritno, and Kuntariningsih (2024) emphasize that technology in financial management can improve efficiency and reduce the risk of business failure. Gouillart & Kelly (1995) and Hijrasil, Maisharah, Widodo, Darsono, & Manuhutu (2023) highlight the importance of information systems and HRIS in supporting effective management, while Sunarmi & Hidayat (2022) demonstrate the application of technology in microfinance institutions.

Received : July 28 2025;
Revised : August 29 2025;
Accepted : September 26, 2025;
Online Available: October 02, 2025;
Current Ver.: October 02, 2025.



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Although numerous studies have examined financial distress and restructuring, previous research has primarily focused on large or medium-sized enterprises (As'ari, 2015; Norley, Swanson, & Marshall, 2012; Cholik, 2021). Aryaningtyas & Palupiningtyas (2017) discuss entrepreneurship education and academic support to enhance students' entrepreneurial intentions, which is relevant for strengthening MSMEs. Palupiningtyas, Mistriani, & Wijoyo (2020) and Karim (2016) emphasize internal and external environmental analysis to enhance local economic development, which can be adapted for micro-enterprises. Lestari (2018) highlights the importance of technological literacy, supporting digital integration in financial management.

This study aims to develop a technology-based financial restructuring model that aligns with the characteristics of local micro-enterprises. The research questions include: (1) the patterns of financial distress among micro-enterprises, (2) the application of technology in financial management, and (3) an effective restructuring model. The urgency of this research is high because micro-enterprises are the backbone of the local economy, and many are vulnerable to financial difficulties.

The research adopts a qualitative approach with a case study strategy: identifying financial distress patterns through interviews and document analysis, analyzing technology application through observation and focus group discussions, and developing a restructuring model based on design thinking involving all stakeholders (Platt & Platt, 2006; Sunarmi & Hidayat, 2022; Pranata & Sinaga, 2023). This approach is expected to produce a model that is applicable, adaptive, and relevant to the real needs of micro-enterprises.

The novelty of this research lies in three aspects: focusing on micro-enterprises with unique challenges, integrating technology with financial restructuring, and employing design thinking and collaborative design involving all stakeholders (Karim, 2016; Lestari, 2018; Surya, 2014; Gouillart & Kelly, 1995). The model is designed considering the limited digital and financial literacy of micro-enterprise actors, making it easier to adopt. The research results are expected to serve as a practical guide for micro-enterprise actors and as a reference for policymakers in developing MSME empowerment programs.

2. Literature Review

2.1. Concepts and Theories of Financial Distress

Financial distress is a condition in which a company faces significant financial difficulties and is at risk of bankruptcy. This usually occurs when a company is unable to meet its financial obligations, such as debt or loan repayments, which can create liquidity pressure and disrupt daily operations (Platt & Platt, 2006; Surya, 2014). Financial distress theory is an important branch of modern capital structure theory, emphasizing the importance of balancing risk and funding structure. Predictive models of financial distress, such as the Altman Z-Score, are widely used to identify early signs of financial difficulty, allowing companies to take preventive measures before the situation worsens. Additionally, company performance evaluation models developed by Ishak et al. (2024) show that systematic financial analysis can improve prediction accuracy and help management make strategic decisions more quickly. Therefore, this theory is not only relevant for large corporations but can also be applied to SMEs to minimize bankruptcy risk.

2.2. Financial Distress in SMEs/Micro-Enterprises

SMEs play a strategic role in the global economy by contributing to job creation and local economic growth. However, this sector often faces financial difficulties due to limited management capacity, capital, and access to formal financing (Situm, 2023). Research indicates that company size, business location, and regional economic conditions are key indicators in explaining financial distress in SMEs. This situation is exacerbated by low financial literacy and limited managerial experience, so many SMEs are unable to respond quickly to market changes. A deep understanding of distress characteristics in SMEs is essential to design more targeted and effective restructuring strategies.

2.3. Financial Restructuring

Financial restructuring is a strategic process of modifying a company's capital and operational structure to overcome financial difficulties and enhance shareholder value. This process may include changes in business models, management reorganization, or debt restructuring (Nga et al., 2018; Helmold & Dathe, 2020). Restructuring can be both reactive and preventive, helping companies face financial pressures before reaching critical points. For

SMEs, the restructuring approach must be tailored to organizational capacity and available resources, including financial literacy and technology adoption, to ensure interventions are effective and efficient.

2.4. The Role of Technology in Financial Management

Technology plays a crucial role in modern financial management, particularly in improving decision-making efficiency and accuracy. The application of AI, blockchain, and big data allows companies to perform credit risk management, digital auditing, and fraud detection more quickly and accurately (Portovaras et al., 2024; Wang, 2022). FinTech, or financial technology, as explained by Di Pietro et al. (2021), provides innovations in financial products and services, including digital payments, credit analysis, and app-based banking systems. The use of technology in financial management not only accelerates internal processes but also enhances transparency, which is essential for SMEs to build trust with investors and other stakeholders.

2.5. Technology-Based Financial Restructuring Models

Technology-based financial restructuring models integrate digital innovations into the restructuring process to enhance the effectiveness and efficiency of financial decisions. The use of AI and machine learning allows more accurate financial distress prediction and the development of targeted corrective strategies (Azhou, 2021; Ando et al., 2024). Additionally, technology-based systems can accelerate financial report analysis, monitor performance, and provide real-time intervention recommendations (Bisht et al., 2022; Sharma et al., 2023). Such models are vital for SMEs, as they enable optimal use of limited resources and improve financial resilience without relying on costly external consultants.

2.6. Limitations of Digital and Financial Literacy

Limited digital and financial literacy is a major barrier to technology adoption in SME financial management. Many SME owners lack the skills or knowledge to leverage available digital tools, while low financial literacy can lead to poor financial decisions and worsen financial distress (Situm, 2023). Therefore, technology-based financial restructuring strategies must be accompanied by training and guidance to ensure entrepreneurs can effectively understand and use technology. Enhancing digital and financial literacy is key to the successful implementation of restructuring models and promotes SME sustainability in the digital era.

3. Research Methodology

This study employs a qualitative approach with a case study strategy to develop a technology-based financial restructuring model for micro-enterprises in Semarang City (Soegiono & Sutanto, 2013; Nasution, 2014). This approach allows researchers to gain a deep understanding of financial distress phenomena and technology application in micro-enterprise financial management.

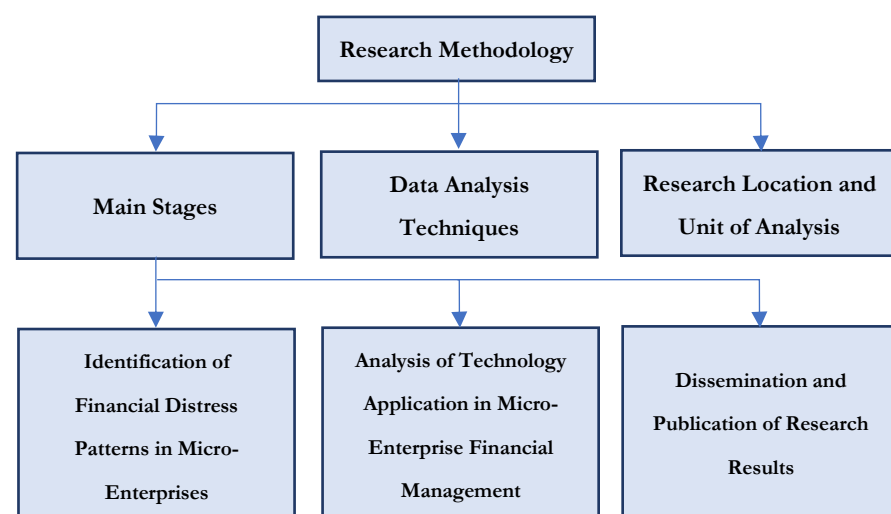


Figure 1. Research Methodology Flowchart.

3.1. Identification of Financial Distress Patterns in Micro-Enterprises

The first stage focuses on collecting and analyzing data related to financial distress. In-depth interviews are conducted with 20 micro-entrepreneurs who have experienced or are at risk of financial distress and 5 financial experts specializing in micro, small, and medium enterprises (MSMEs). Semi-structured interviews explore the causes, characteristics, and impacts of financial distress. Financial documents such as cash flow records, simple profit-and-loss statements, and debt/receivable records are analyzed to identify patterns of financial difficulties. The data are analyzed using a thematic approach, including coding, theme identification, and interpretation (Soegiono & Sutanto, 2013).

3.2. Analysis of Technology Application in Micro-Enterprise Financial Management

The second stage assesses how technology is applied in financial management. Participatory observation is conducted in 10 micro-enterprises to understand existing technology practices (Rivai, Pranata, Fadila, Syahlina, & Ginting, 2021). Three Focus Group Discussion (FGD) sessions are organized: the first with 8 micro-entrepreneurs who have adopted technology, the second with 8 entrepreneurs with minimal or no technological adoption, and the third with 6 fintech service providers and 2 banking representatives. Technology mapping identifies available and potential tools, followed by a gap analysis comparing financial management needs with existing technology. The financial restructuring model is developed through a design thinking workshop involving micro-entrepreneurs, financial experts, and technology specialists, followed by prototyping and validation through FGD with 12 micro-entrepreneurs, 3 financial experts, and 3 IT experts (Nasution, 2014).

3.3. Dissemination and Publication of Research Results

The final stage covers dissemination and publication, including preparation of scientific articles for national and international journals, organization of seminars to share findings with academics, practitioners, and policymakers, and development of policy briefs for the Semarang City Cooperative and MSME Office and other relevant institutions. These activities ensure that the research findings are implemented and practically utilized.

3.4. Data Analysis Techniques

Data analysis uses several complementary methods. Thematic analysis identifies common patterns of financial distress, involving familiarization, coding, theme identification, theme review, and interpretation. SWOT analysis evaluates strengths, weaknesses, opportunities, and threats in applying technology for financial restructuring. Data triangulation ensures validity and reliability by comparing information from multiple sources and methods. Comparative analysis evaluates the developed model against existing models or approaches.

3.5. Research Location and Unit of Analysis

The study is conducted in Semarang City, focusing on five districts with high concentrations of micro-enterprises: Tembalang, Banyumanik, Pedurungan, Ngaliyan, and Semarang Barat.

4. Results and Discussion

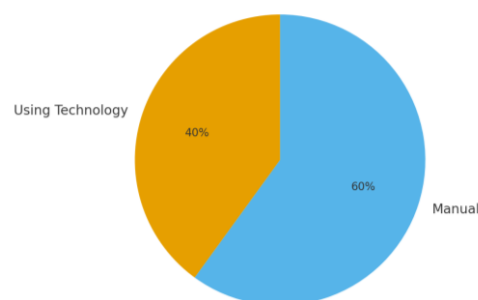
4.1. Result

Data analysis of 20 MSME actors in five districts of Semarang City shows a diverse pattern of financial distress risk. Based on cash flow, payment delays, and debt/receivable management, it was found that 20% of MSMEs are at low risk, 40% at medium risk, and 40% at high risk (Table 1). These findings indicate that the majority of MSMEs (80%) face potential business sustainability challenges if no financial restructuring efforts are implemented.

Table 1. Financial Distress Risk Levels of MSMEs in Semarang.

Financial Distress Risk	Number of MSMEs	Percentage (%)
Low	4	20
Medium	8	40
High	8	40
Total	20	100

Participatory observation and FGD findings reveal that only 40% of MSMEs have adopted technology in financial recording, while 60% still rely on manual methods (Figure 2). This situation reflects limited digital adoption that potentially slows down financial monitoring and cash flow oversight..

**Figure 2.** Percentage of MSMEs Implementing Technology in Financial Management.

Furthermore, gap analysis confirms an urgent need for a simple, adaptive financial restructuring model suited to the limited digital and financial literacy of MSMEs. The needs include structured transaction recording, real-time cash flow monitoring, and systematic financial performance analysis (Table 2).

Table 2. Gaps in Technology Adoption for MSME Financial Management.

Financial Management Aspect	Current Practice	MSME Needs
Transaction Recording	Manual (60%)	Digital (100%)
Cash Flow Monitoring	Manual (50%)	Real-time (100%)
Performance Analysis	Unsystematic	Systematic & Digital (100%)

4.2. Discussion

The findings indicate that most MSMEs in Semarang face medium to high levels of financial distress risk. This aligns with Situm (2023), who noted that limited management capacity and restricted access to financing are major factors that make MSMEs vulnerable to financial difficulties.

The analysis of 20 MSMEs in Semarang shows that 80% of enterprises fall into medium to high categories of financial distress risk, while only 20% are in low risk. This means that four out of five MSMEs are financially vulnerable, particularly in terms of cash flow delays, debt repayment, and receivables management. Such a high proportion reflects the structural weakness of financial practices among small businesses.

Observations also reveal that only 40% of MSMEs have adopted technology for financial management, while 60% still depend on manual methods. This imbalance directly affects the effectiveness of financial monitoring and the timeliness of financial decision-making. The enterprises that continue to rely on manual systems face difficulties in ensuring accurate and real-time tracking of financial performance.

The findings highlight a critical link between the level of financial distress and the low adoption of digital tools. MSMEs with manual practices are more exposed to risks due to lack of transparency and delayed responses. Meanwhile, those adopting digital tools show better capacity to manage financial transactions and monitor performance, although they remain in the minority.

5. Comparison

A comparison between current practices and the actual needs of MSMEs shows a wide gap. For example, while 60% still rely on manual transaction recording, all MSMEs (100%) actually need digital systems for accuracy and efficiency. Similarly, 50% continue to monitor cash flow manually, yet all enterprises require real-time monitoring to prevent financial mismanagement.

The same pattern is found in performance analysis, where current practices remain unsystematic, while the demand is for systematic and digital-based solutions. This clear mismatch emphasizes the urgency for financial restructuring models that are not only digital but also simple and adaptive to the limited literacy levels of MSMEs.

6. Conclusion

This study shows that the majority of MSMEs in Semarang are facing significant financial risks. Out of 20 enterprises analyzed, 80% were identified in medium to high financial distress categories, leaving only 20% at low risk. These findings reflect weaknesses in financial structures, particularly in cash flow management, debt repayment, and receivables monitoring.

Another important finding is the low level of technological adoption. Only 40% of MSMEs have implemented digital tools in financial management, while 60% still rely on manual methods. This condition contributes to inefficiencies, delays in decision-making, and higher vulnerability to financial instability. The gap between current practices and actual needs indicates that MSMEs are not yet equipped with adequate tools to ensure financial sustainability.

To address these challenges, it is necessary to develop simple, adaptive, and digital-based restructuring models. Such models should prioritize transaction recording, real-time cash flow monitoring, and systematic performance analysis. By closing the gap between existing practices and the demand for 100% digital solutions, MSMEs will be able to strengthen financial resilience, improve efficiency, and ensure business continuity in the long run.

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