



Breaking the Digital Barrier: Reimagining Accounting Information Systems for Micro, Small, and Medium Enterprises

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Abstract

This study examines the barriers to the adoption of Accounting Information Systems (AIS) among micro, small, and medium enterprises (MSMEs) in Bali, Indonesia, a setting that reflects many of the institutional, technological, and resource constraints commonly faced by businesses in emerging economies. The study seeks to develop an adaptive framework for AIS implementation that is sensitive to the limited digital capabilities, managerial capacity, and financial resources of MSMEs. Employing a qualitative exploratory case study design, the study draws on in-depth interviews with 19 MSME owners and managers. The interview data were analysed using thematic analysis to identify recurring patterns, challenges, and contextual conditions influencing AIS adoption. The findings reveal six interrelated barriers: resource constraints, limited managerial competence, perceived technological complexity, resistance to change, external pressures, and fragmented integration with cloud-based solutions. These barriers do not operate in isolation; rather, they collectively shape how MSME actors perceive the usefulness, feasibility, and long-term value of AIS implementation. The study concludes that AIS adoption in MSMEs should be understood as a contextual and gradual process rather than a uniform technological intervention. Successful implementation requires more than access to accounting software; it depends on targeted digital literacy support, managerial capacity-building, and modular AIS designs that are affordable, user-friendly, and compatible with existing business practices. These findings offer practical implications for policymakers, technology providers, and business support institutions seeking to improve MSME financial reporting, internal control, and decision-making through more inclusive and contextually realistic AIS strategies.

Keywords: accounting information systems, msme, digital literacy, technology adoption

Introduction

Micro, small, and medium enterprises (MSMEs) occupy a central position in Indonesia's economy. This role is particularly evident in Bali, where MSMEs contributed approximately 61% to the province's gross domestic product in 2020 (NusaBali, 2023). Beyond their economic contribution, MSMEs also provide a substantial source of employment and livelihood for local communities. Despite this importance, many MSMEs continue to face persistent difficulties in financial management, especially in maintaining accurate accounting records and preparing reliable financial reports. In this regard, the adoption of Accounting Information Systems (AIS) has been widely recognised as a means of improving operational efficiency, strengthening financial reporting accuracy, and supporting better business decision-making among MSMEs (Kareem et al., 2024; Zubairu et al., 2025).

However, AIS adoption among Indonesian MSMEs remains relatively limited. Prior evidence suggests that low levels of digital literacy, shortages of skilled human resources, inadequate technological infrastructure, and limited access to mentoring support continue to constrain the effective use of AIS in this sector (Hamundu et al., 2021). These barriers restrict the ability of MSMEs to benefit from digital accounting tools, particularly in improving financial control, managerial decision-making, productivity, and competitiveness in an increasingly digital business environment (Darmawan, 2023; Darmawan & Putra, 2025).

Previous studies have examined various determinants of AIS adoption in MSMEs. Restrepo-Morales et al. (2024), for example, highlight the importance of digital literacy and users' understanding of technological benefits in supporting successful AIS implementation. Similarly, Wyrwicka & Chuda (2019) emphasise the role of organisational readiness, external pressure, and managerial support in shaping technology adoption outcomes. Although these studies provide valuable insights, much of the existing literature tends to treat technological, organisational, and environmental factors as parallel and relatively independent determinants of adoption. This approach is useful for identifying adoption antecedents, but it offers limited explanation of how these factors interact when MSMEs operate under severe resource constraints.

In particular, less attention has been given to the way internal organisational limitations may condition the influence of technological availability and external pressure on AIS implementation. Financial scarcity, weak managerial accounting competence, limited digital literacy, and resistance to change may not simply exist as separate barriers; rather, they may filter, weaken, or even prevent the translation of adoption intention into sustained AIS use. This creates an important theoretical gap. AIS adoption should not be understood merely as a decision to acquire or use technology, but as a conditional process shaped by the capacity of MSMEs to absorb, configure, and maintain accounting technologies within their existing business practices.

The Balinese MSME context offers a relevant empirical setting for examining this issue. MSMEs in Bali operate within an economic environment strongly influenced by tourism dependence, informal business practices, uneven digital capability, and growing demands for financial accountability. These conditions provide a useful basis for assessing whether technological and environmental drivers are sufficient to produce meaningful AIS implementation, or whether their effects are constrained by organisational readiness.

Accordingly, this study does not position Bali merely as an underexplored research location. Rather, it uses the Balinese MSME context to examine a broader theoretical issue: how organisational capability functions as a filtering mechanism between adoption pressures and sustainable AIS use.

Existing studies have generally focused on generic determinants of AIS adoption, while giving less attention to adaptive mechanisms that reflect local constraints and institutional realities (Putri et al., 2025; Sánchez et al., 2025). To address this gap, the present study adopts a qualitative approach to examine the specific challenges faced by MSMEs in Bali and to develop a locally grounded framework for AIS implementation. Instead of merely identifying adoption barriers, the study seeks to formulate an actionable framework for digital accounting transformation that is realistic for MSMEs with limited resources and varying levels of digital readiness.

The study is guided by the Technology–Organisation–Environment (TOE) framework developed by Tornatzky & Fleischer (1990). This framework provides a suitable analytical lens for examining the interaction between technological conditions, organisational readiness, and environmental pressures. By applying the TOE framework in a context-sensitive manner, this study extends its use beyond a static classification of adoption factors. It examines how the three dimensions interact within the practical realities of MSMEs and how organisational capability may shape the sustainability of AIS implementation. In doing so, the study aims to contribute both theoretically and practically by offering a framework that integrates local human capital capacity, technological suitability, and institutional support for more effective AIS adoption among MSMEs.

Prior research on Accounting Information Systems (AIS) adoption has frequently relied on individual-level models, particularly the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). These frameworks are valuable for explaining adoption through user perceptions, behavioural intention, and technology acceptance. However, they are less adequate for explaining AIS implementation in resource-constrained micro, small, and medium enterprises (MSMEs), where adoption challenges often extend beyond individual willingness to use technology. In such settings, barriers are commonly rooted in structural constraints, including limited financial capacity, inadequate human resources, weak managerial competence, low digital literacy, and insufficient system integration capability. For this reason, the present study adopts the Technology–Organisation–Environment (TOE) framework as its primary analytical lens, as it allows a broader examination of the technological, organisational, and environmental conditions that shape AIS adoption.

Nevertheless, this study does not treat TOE as a standalone or merely classificatory framework. To strengthen its explanatory depth, the TOE framework is complemented by the Resource-Based View (RBV) and Institutional Theory. RBV is used to explain how internal organisational resources, including financial capacity, accounting knowledge, managerial competence, digital capability, and human capital, influence the ability of MSMEs to absorb, configure, and sustain AIS implementation. From this perspective, resource limitations are not simply operational obstacles. Rather, they represent strategic capability constraints that determine whether available technologies can be translated into meaningful accounting value.

Institutional Theory further extends the TOE perspective by explaining how regulatory, market, and legitimacy pressures shape AIS adoption. In the MSME context, external pressures may encourage firms to adopt digital accounting systems to satisfy tax compliance requirements, enhance reporting legitimacy, or maintain competitive alignment. However, such pressures do not necessarily lead to substantive AIS implementation. When organisational readiness is weak, regulatory and competitive pressures may produce only symbolic or compliance-oriented adoption, in which AIS is used superficially to meet reporting obligations rather than being integrated into routine financial management and decision-making. Accordingly, this study positions TOE as the overarching framework, RBV as the theoretical basis for explaining internal capability constraints, and Institutional Theory as the lens for understanding external pressure and legitimacy-driven adoption.

Building on this integrated theoretical foundation, the study refines the application of the TOE framework by examining organisational readiness as a filtering mechanism between technological and environmental pressures, on the one hand, and substantive AIS implementation, on the other. This perspective enables the study to move beyond the identification of adoption barriers and to explain why AIS adoption among MSMEs may remain fragmented, superficial, or unsustainable, even when digital technologies are accessible and external pressures are present ([Ayoub et al., 2020](#); [Gonzalez-Loureiro et al., 2017](#)).

This study offers several contributions to the literature on AIS adoption in MSMEs. First, it contributes conceptually by extending the TOE framework into a conditional and mechanism-oriented model, in which organisational readiness mediates the relationship between technological and environmental pressures and substantive AIS implementation. Second, it provides contextual evidence from Balinese MSMEs, showing how tourism dependence, informal financial practices, uneven digital capability, and increasing demands for financial accountability shape AIS implementation in an emerging-economy setting. While prior studies have examined AIS adoption more generally ([Azmi et al., 2016](#); [Chouki et al., 2018](#)), this study addresses a more specific gap by situating AIS adoption within Bali's distinctive socio-economic and cultural environment ([Setyaningsih & Nengzih, 2020](#)).

Third, the study develops a practical and context-sensitive model for MSMEs in Bali by integrating human resource capacity, managerial accounting competence, technological suitability, and institutional support. These elements are particularly important for addressing persistent barriers such as low digital literacy, limited financial resources, and inadequate access to technological assistance ([Hoang et al., 2024](#); [Mediaty et al., 2025](#)). The findings therefore have practical implications for policymakers, technology providers, and MSME support institutions. Specifically, AIS adoption strategies should not be limited to providing software or conducting general digital literacy training. They should also strengthen managerial accounting competence, improve financial and technical readiness, and provide integrated mentoring support that enables MSMEs to embed AIS into everyday business practices ([Diana et al., 2025](#); [Zavodna et al., 2024](#)). In this regard, stronger collaboration between MSMEs, institutional actors, and technology mentors is essential for supporting more sustainable and meaningful AIS implementation ([Alamin et al., 2015](#)).

Research Method

This study adopts a qualitative approach to examine the challenges faced by micro, small, and medium enterprises (MSMEs) in Bali in implementing Accounting Information Systems (AIS). A qualitative design is considered appropriate because AIS adoption in MSMEs is not merely a technical decision, but a socially and organisationally embedded process shaped by owners' perceptions, managerial capacity, resource availability, and day-to-day business practices. This approach therefore allows the study to capture the complexity of technology adoption from the perspective of MSME actors themselves.

The study employs an exploratory case study design (Creswell & Creswell, 2017). This design is suitable given the limited empirical attention paid to AIS adoption among MSMEs in Bali, particularly within its distinctive socio-economic and cultural setting. The purpose of the study is not only to identify the main barriers to AIS adoption, but also to develop an adaptive implementation framework that reflects the practical realities, constraints, and institutional conditions faced by MSMEs in this local context.

To enhance the transferability of the findings across the heterogeneous MSME landscape, the study used maximum variation sampling. Participants were purposively selected to represent different business sectors, including culinary, craft, retail, and services, as well as different business scales—micro, small, and medium enterprises—as classified under Indonesian Law No. 20 of 2008. This sampling strategy enables the study to examine how AIS adoption challenges vary across different organisational capacities, for example between a micro-scale street vendor and a medium-scale exporter.

A total of 19 key informants, consisting of MSME owners and financial managers, participated in the study. Data collection continued until theoretical saturation was reached. Saturation was initially observed in the seventeenth interview, when no substantially new codes or themes emerged from the data. Two additional interviews were then conducted to confirm the stability of the emerging themes and to strengthen the credibility of the findings.

The qualitative data were analysed using systematic thematic analysis, supported by NVivo 12 to enhance rigour, transparency, and auditability. The analytical procedure followed the three-stage coding process proposed by Miles et al. (2014), consisting of data condensation, data display, and conclusion drawing.

The first stage involved data condensation through open coding. Interview transcripts were read repeatedly to develop familiarity with the data and to identify meaningful units of analysis. Initial codes were then assigned to relevant statements and experiences expressed by participants. For example, comments related to internet costs, software subscription fees, and limited working capital were coded as financial barriers. This stage allowed the study to capture participants' experiences without imposing premature theoretical categories.

The second stage involved data display through axial coding. At this stage, related open codes were compared, reorganised, and grouped into broader categories. For instance, codes such as staff resistance, limited owner knowledge of information technology, and lack of accounting skills were clustered under competency-related barriers. This process helped clarify the relationships among codes and provided a more structured understanding of the conditions affecting AIS implementation among MSMEs.

Table. 1 Participant Demographics and Business Characteristics

ID	Business Sector / Type	Business Scale	Years	Role	Gender	Current AIS Status
IF01	Government Agency (Regulator)	N/A	N/A	SME Digitalization Section	M	N/A (Policy Maker)
IF02	Culinary (Traditional Warung)	Micro	5	Owner	F	Manual (Notebook)
IF03	Handicraft (Wood Carving)	Micro	12	Owner/Craftsman	M	Manual (Notebook)
IF04	Retail (Grocery/Kelontong)	Micro	8	Owner	F	Manual + Calculator
IF05	Services (Laundry)	Micro	3	Owner	M	Basic Excel
IF06	Culinary (Street Food)	Micro	4	Owner	F	Manual
IF07	Culinary (Coffee Shop)	Small	4	Operational Manager	M	Point of Sales (POS)
IF08	Fashion (Balinese Kebaya)	Small	6	Owner	F	Excel (Single User)
IF09	Services (Spa & Wellness)	Small	5	Manager	F	POS + Manual Log
IF10	Handicraft (Silver Jewelry)	Small	15	Owner	M	Legacy Software (Desktop)
IF11	Retail (Souvenir Shop)	Small	7	Finance Staff	F	POS (Cloud-based)
IF12	Services (Tour & Travel)	Small	9	Owner	M	Excel & Google Sheets
IF13	Culinary (Local Restaurant)	Small	10	Owner	F	POS (Fragmented)
IF14	Creative (Digital Printing)	Small	3	Owner	M	Excel
IF15	Hospitality (Boutique Villa)	Medium	8	General Manager	M	Integrated Hotel System
IF16	Export (Furniture/Cargo)	Medium	20	Finance Manager	F	Accounting Software (MYOB/Accurate)
IF17	Retail (Wholesale/Grosir)	Medium	12	Owner	M	Custom ERP (Outdated)
IF18	Culinary (Chain/Franchise)	Medium	6	Owner	F	Cloud Accounting (Xero/Jurnal)
IF19	Manufacturing (Garment)	Medium	11	Owner	M	Accounting Software

Source: Processed Data, 2026

The final stage involved conclusion drawing through selective coding. The broader categories developed during axial coding were mapped onto the modified Technology–

Organisation–Environment framework to generate the six final themes presented in the findings. This process enabled the study to connect empirical patterns from the interview data with the theoretical framework, while still preserving the contextual richness of participants' experiences.

To strengthen trustworthiness, the study employed data source triangulation by comparing interview transcripts with field observation notes. In addition, member checking was conducted by returning a summary of the preliminary findings to three key participants. Their feedback was used to verify whether the interpretations accurately reflected their experiences and to reduce the risk of researcher misinterpretation.

Table 2. Thematic Coding Structure (Audit Trail Example)

Raw Data Excerpts (Translation)	Open Coding (Level 1)	Axial Coding (Level 2)	Aggregate Dimension (Theme)
<i>"We want to use a proper accounting system, but paying the subscription and hiring someone to manage it is simply beyond our monthly budget."</i> (Participant IF02 - Culinary MSME)	-High subscription costs - Inability to hire specialized staff	Financial & Human Capital Scarcity	Resource Limitations (Organizational Context)
<i>"I only use AIS for basic invoicing; I don't really understand the reports, so I still rely on manual notes for important decisions."</i> (Participant IF12 - Tourism MSME)	- Lack of accounting knowledge - Inability to interpret data output	Low Managerial Digital Literacy	Insufficient Managerial Competence (Organizational Context)
<i>"The system has too many menus and settings; we get confused and are afraid of making mistakes, so we often go back to Excel."</i> (Participant IF03 - Handicraft MSME)	- Complex user interface - Fear of operational errors	Perceived Difficulty	Technological Complexity (Technological Context)
<i>"Regulations push MSMEs to adopt digital reporting, but many micro businesses tell us the cost and complexity of these systems are still too high for them."</i> (Participant IF01 - Government Regulator)	- Mandatory tax compliance - Regulatory burden vs. Capability	Regulatory Pressure	External Pressures (Environmental Context)

Source: Processed Data, 2026

Ethical considerations were carefully observed throughout the research process. Prior to data collection, all participants were informed about the purpose of the study, the nature of their involvement, and their rights as research participants. Informed consent was obtained from each participant, including confirmation that participation was voluntary and that they could withdraw from the study at any stage without any negative consequences.

To protect participants' privacy, all data were treated confidentially, and identifying information was removed or anonymised during data processing and reporting. The study also ensured that interview materials, field notes, and related research data were handled securely to prevent unauthorised access. These procedures were undertaken to safeguard participants' rights, dignity, and anonymity, in accordance with ethical principles for qualitative research.

Result and Discussion

The findings reveal several key challenges encountered by MSMEs in Bali in implementing Accounting Information Systems (AIS). These challenges were identified through interviews with 19 informants, consisting of government representatives, MSME owners, and managers. The interview data indicate that AIS adoption is shaped by a set of interrelated barriers, including resource limitations, insufficient managerial competence, technological complexity, resistance to change, external pressures, and difficulties in integrating cloud-based AIS with existing business processes.

Resource constraints emerged as one of the most prominent obstacles. Many MSMEs reported limited financial capacity, a shortage of skilled personnel, and inadequate managerial knowledge of accounting and digital systems. These limitations reduce their ability not only to acquire AIS, but also to operate and sustain its use in daily business activities. In addition, participants frequently highlighted technological barriers, particularly low digital literacy and difficulties in aligning AIS with existing operational and financial routines.

The adoption process was further complicated by organisational and environmental factors. Internally, resistance from owners or employees often slowed the transition from manual record-keeping to digital accounting practices. Externally, regulatory requirements, competitive pressure, and expectations for more accountable financial reporting encouraged MSMEs to consider AIS adoption, but these pressures did not always translate into effective implementation. Taken together, the findings suggest that AIS adoption among MSMEs in Bali is not merely a technological issue, but a broader organisational process shaped by resources, capabilities, attitudes, and external demands.

One of the most frequently reported barriers to AIS implementation was resource limitation. MSMEs in Bali, particularly those operating in the tourism and retail sectors, often face financial constraints and shortages of qualified personnel, both of which restrict their ability to invest in and sustain the use of AIS. This concern was reflected in the statement of one culinary business owner: "We want to use a proper accounting system, but paying the subscription and hiring someone to manage it is simply beyond our monthly budget" (PM, culinary MSME owner). This finding is consistent with [Hermawan et al. \(2025\)](#), who identify financial limitations and insufficient human capital as major obstacles to technology adoption in SMEs. Informants similarly indicated that

limited funds for system acquisition, maintenance, and staff development weakened their capacity to implement AIS effectively.

Table 3. Key Findings

Theme	Challenges Identified	Relevant Quotes
Resource Limitations	Financial constraints, shortage of skilled personnel	"We simply don't have the budget to hire skilled staff..." (IF-03, 5')
Managerial Competence	Lack of accounting/IT knowledge, weak project management	"Our management doesn't understand the full potential of AIS..." (IF-06, 4')
Technological Complexity	System integration, digital literacy gaps, infrastructure issues	"The AIS system we have is cloud-based, but it doesn't sync well..." (IF-02, 3')
Resistance to Change	Employee reluctance, organizational inertia	"There's a lot of fear that automation will replace jobs..." (IF-04, 5')
External Pressures	Regulatory and competitive pressures	"We are forced by the regulations to adopt these systems, but the financial burden is too much..." (IF-13, 9')
Integration Issues (Cloud)	Partial integration, compatibility problems with cloud systems	"It's not fully integrated with our payroll and production systems..." (IF-11, 7')

Source: Processed Data, 2026

These findings also support [Mediaty et al. \(2025\)](#), who argue for affordable and modular AIS solutions that can be adjusted to the financial capacity of SMEs. Such systems are particularly relevant for smaller businesses, as they allow gradual adoption without imposing excessive financial burdens. From the perspective of the resource-based view, technology may contribute to competitive advantage when firms are able to mobilise both tangible and intangible resources to improve efficiency, control, and innovation ([Barney, 1991](#)). However, the findings of this study suggest that resource scarcity should not be viewed merely as a financial problem. Rather, it operates as a binding constraint that limits the capacity of MSMEs to absorb, operate, and sustain AIS. Even when AIS solutions are affordable or technically accessible, they may fail to generate accounting value if firms lack the financial slack and human resources needed to convert technological availability into routine accounting practices. In this sense, resource limitation becomes a central filtering mechanism that weakens the effect of technological readiness on AIS implementation.

Managerial competence emerged as another important barrier to AIS adoption among MSMEs in Bali. Many owners and managers reported limited knowledge of accounting and information technology, which restricted their ability to recognise the potential benefits of AIS and use the system beyond basic administrative functions. As one tourism business owner explained, "I only use AIS for basic invoicing; I don't really

understand the reports, so I still rely on manual notes for important decisions” (WB, tourism MSME owner). This statement illustrates that AIS adoption does not automatically improve decision-making when users lack the competence to interpret and apply the information generated by the system.

The importance of managerial competence is consistent with [Lutfi et al. \(2025\)](#), who emphasise that managerial knowledge and involvement are critical to successful AIS adoption. Without sufficient knowledge, managers may struggle to select appropriate systems, design implementation strategies, and integrate AIS with existing business processes. In some MSMEs, fragmented management structures further weaken project coordination and reduce the effectiveness of implementation. Prior studies also suggest that top management support is essential in technology adoption because leadership involvement influences resource allocation, employee commitment, and strategic alignment ([Alquhaif & Al-Mamary, 2025](#); [Mahama & Dahlan, 2021](#)).

Conceptually, weak managerial competence reflects an absorptive capacity problem. AIS can produce digital records, financial reports, and operational data, but these outputs become valuable only when managers are able to interpret them and incorporate them into planning, monitoring, and decision-making. Accordingly, low managerial competence does not merely slow the adoption process. It also reduces the organisation’s ability to transform AIS outputs into meaningful accounting information and managerial action. This finding reinforces the need for targeted training programmes that strengthen accounting literacy, digital capability, and project management skills among MSME owners and managers.

Technological complexity also emerged as a major barrier to AIS implementation among MSMEs in Bali. Many participants reported difficulties arising from limited digital literacy, inadequate IT infrastructure, and challenges in integrating AIS with other business functions, particularly when using cloud-based systems. This perceived complexity was reflected in the statement of one handicraft entrepreneur: “The system has too many menus and settings; we get confused and are afraid of making mistakes, so we often go back to Excel” (NA, handicraft MSME owner). Such experiences indicate that AIS complexity is not limited to the technical features of the software, but also relates to users’ confidence, familiarity, and ability to incorporate the system into daily business routines.

Participants also reported difficulties in synchronising AIS with payroll, inventory, sales, and other operational systems. These integration problems created inefficiencies and, in some cases, encouraged businesses to maintain parallel manual records. This finding is consistent with [Wynn et al. \(2009\)](#), who identify system integration as a common barrier for SMEs adopting complex AIS, particularly cloud-based systems. Similarly, [Keong et al. \(2025\)](#) and [Otake \(2022\)](#) note that insufficient technical support and weak IT infrastructure may disrupt business operations and reduce the effectiveness of digital accounting systems. To address these challenges, prior studies have emphasised the importance of scalable, user-friendly systems, supported by practical training and digital literacy development ([Ferneley & Bell, 2006](#); [Suraweera et al., 2006](#)). In the context of Balinese MSMEs, these findings suggest that AIS implementation should be designed around simplicity, gradual learning, and compatibility with existing business practices.

Resistance to change represented another significant challenge in the adoption of AIS. Several participants indicated that employees were reluctant to shift from familiar manual procedures to digital systems, partly because they perceived AIS as disruptive to

established routines. Concerns about job security and the possible replacement of manual work by automation were also evident. As one hospitality business owner explained, “Our senior staff feel more comfortable with paper; they say the computer makes their work slower and worry that automation will make their role unnecessary” (SY, hospitality MSME owner). This finding aligns with prior studies showing that organisational inertia and employee resistance are common obstacles in SME technology implementation (Abdulle, 2019; Darmawan et al., 2024; Januszewski, 2023; Schwaeye et al., 2025; Tina et al., 2023).

The findings further suggest that resistance to change is not merely an attitudinal problem. It reflects deeper concerns about role uncertainty, loss of control, and insufficient organisational support. In MSMEs where work routines are informal and accounting knowledge is often embedded in individual experience, AIS may be perceived as a threat to established ways of managing financial records. Employee involvement, participatory training, and clear communication are therefore important for reducing resistance and building acceptance. Informants indicated that employees were more willing to use AIS when they understood its practical benefits, not only for the business, but also for their own work efficiency and professional development. This is consistent with prior evidence that open communication, trust, and supportive organisational culture can reduce resistance to technological change (Arlbjorn et al., 2009; Kareem et al., 2021; Shaikhmag, 2025).

External pressures were also found to shape AIS adoption among MSMEs, although their effects were ambivalent. On the one hand, regulatory requirements, tax compliance obligations, and competitive pressures encouraged MSMEs to adopt digital accounting systems. Accurate financial records are increasingly necessary for reporting, taxation, access to financing, and business legitimacy. On the other hand, compliance with these expectations often requires systems, skills, and maintenance costs that many MSMEs cannot easily afford. A government representative captured this tension by noting: “Regulations push MSMEs to adopt digital reporting, but many micro businesses tell us the cost and complexity of these systems are still too high for them” (DP, Head of UMKM Department, Bali Province).

This finding shows that environmental pressure may create a coercive push toward AIS adoption without necessarily producing substantive implementation. Regulatory and competitive demands may lead MSMEs to adopt AIS for compliance or legitimacy purposes, but when these pressures are not accompanied by financial support, technical assistance, and managerial capability, adoption may remain superficial. In such cases, AIS is used mainly to satisfy reporting requirements rather than to improve internal financial management, decision-making, or control (Canning & Found, 2015; Ismail, 2009; Kareem et al., 2024). Accordingly, policy interventions should move beyond encouraging adoption and should instead strengthen the organisational capabilities required for meaningful and sustained AIS use.

Integration with cloud-based AIS was also frequently identified as a critical barrier. Many MSMEs reported that their accounting systems were only partially connected to other business functions, including inventory, payroll, sales, and production. One manufacturing owner explained this problem as follows: “Our AIS is in the cloud, but it doesn’t talk to our inventory and payroll; we still have to input the same data several times” (EK, manufacturing MSME owner). This partial integration reduces the efficiency

of AIS because the same transaction data must be entered repeatedly across different systems, increasing the risk of inconsistency, error, and reporting delays.

From an accounting perspective, integration is not merely a technical feature. It is central to the quality, completeness, timeliness, and reliability of accounting information. When AIS is disconnected from operational systems, financial data remain fragmented across multiple records and cannot fully support managerial decision-making. Prior studies similarly emphasise that integration and compatibility are important conditions for AIS effectiveness in SMEs (Almgrashi, 2020; Ha, 2020). The findings therefore suggest that cloud-based AIS should be developed not only as affordable software, but as an integrated information infrastructure that connects accounting records with the operational realities of MSMEs.

Taken together, the findings can be interpreted through an integrated TOE–RBV–Institutional Theory perspective. Within the TOE framework, technological complexity and cloud integration issues represent technological barriers; resource limitations, managerial competence, and resistance to change represent organisational barriers; while regulatory and competitive pressures represent environmental barriers. However, the evidence suggests that these dimensions do not operate as equal and independent determinants of adoption. Instead, organisational readiness plays a more decisive role in determining whether technological availability and environmental pressure can be translated into substantive AIS implementation.

The Resource-Based View helps explain this mechanism. For MSMEs, AIS adoption requires more than access to software. It requires financial resources to maintain subscriptions, human resources to operate the system, managerial accounting knowledge to interpret reports, and digital capability to integrate AIS into daily routines. When these resources are weak, technological availability does not automatically improve accounting practice. Instead, MSMEs may revert to manual records, use AIS only for basic invoicing, or operate fragmented systems that provide limited support for decision-making.

Institutional Theory further explains why environmental pressure may produce uneven adoption outcomes. Regulatory requirements and competitive expectations may encourage MSMEs to adopt AIS to demonstrate compliance and legitimacy. However, when such pressures are not supported by sufficient organisational capability, adoption may become symbolic or compliance-oriented. Under these conditions, AIS is used primarily to satisfy external reporting expectations rather than to improve financial reporting quality, managerial decision-making, or risk control. This explains why environmental pressure can simultaneously encourage AIS adoption and constrain its substantive implementation.

The theoretical contribution of this study lies in demonstrating that organisational readiness functions as a filtering mechanism within the TOE framework. Technological and environmental factors may create pressure for adoption, but their effects are conditioned by the internal resource base and capability structure of MSMEs. This mechanism helps explain why AIS implementation in resource-constrained MSMEs often becomes fragmented, partial, or unsustainable.

Building on the six empirical themes, this study develops an adaptive TOE-based framework for AIS implementation in MSMEs, as illustrated in Figure 1. The findings show that barriers to AIS adoption do not operate independently. Resource limitations restrict the ability of firms to acquire and maintain AIS, while weak managerial competence limits their ability to interpret and use accounting outputs. Technological complexity increases

perceived implementation risk, and resistance to change reduces the likelihood that AIS will be embedded into daily routines. At the same time, external pressures may increase the perceived need for AIS, but without adequate organisational readiness, these pressures may lead only to symbolic or fragmented adoption. This interaction explains why AIS implementation in MSMEs often remains partial, unstable, and weakly connected to accounting decision-making.

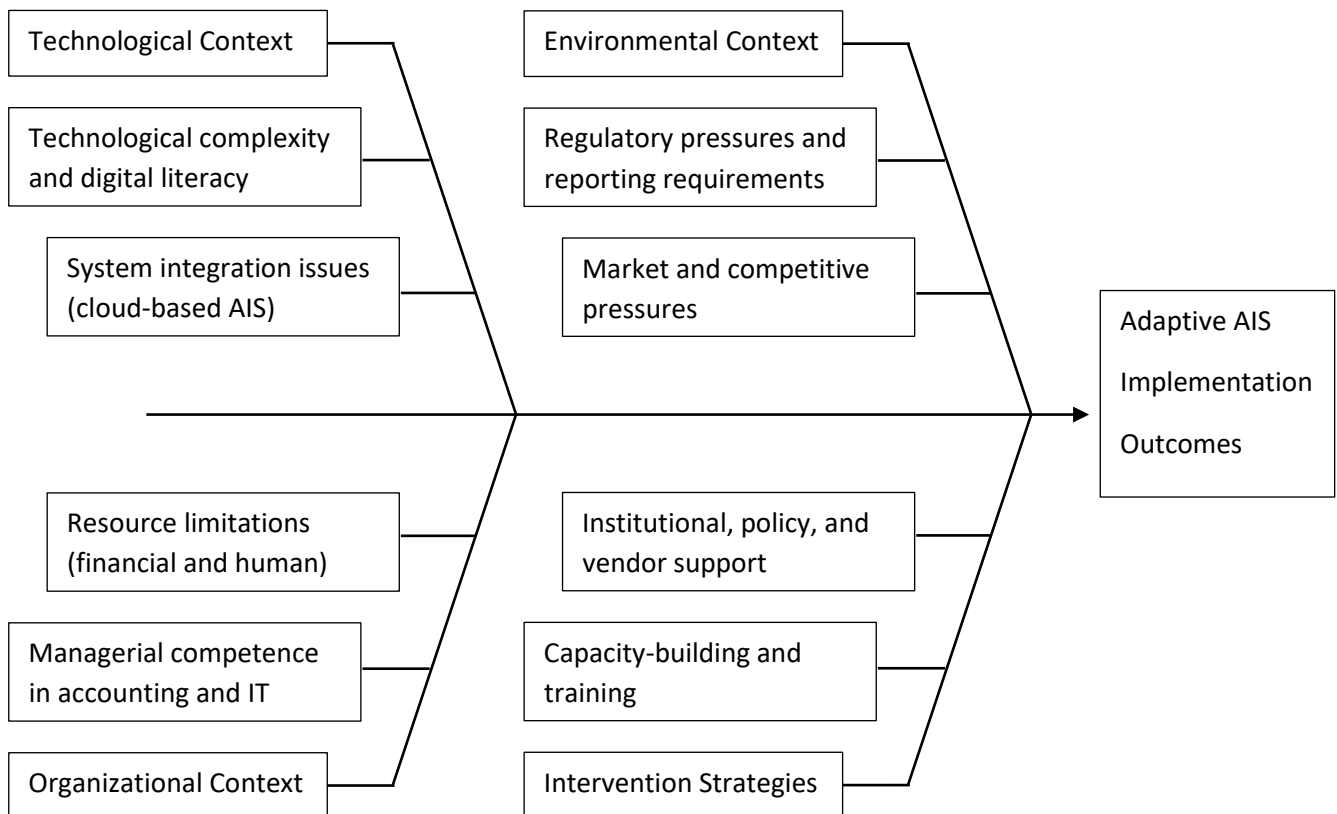


Figure 1. Adaptive TOE-based framework for AIS implementation in MSMEs

Source: Processed Data, 2025

As illustrated in [Figure 1](#), the proposed framework incorporates several intervention strategies intended to mitigate barriers to AIS adoption and support more adaptive implementation outcomes. Capacity-building and training programmes are particularly important for reducing perceived technological complexity, improving users' digital literacy, and strengthening managerial competence in accounting and information technology. At the same time, institutional, policy, and vendor support can assist MSMEs in responding to regulatory and market pressures through targeted incentives, technical assistance, simplified reporting procedures, and AIS solutions that are better aligned with their operational capabilities ([Kachi et al., 2023](#); [Rawashdeh et al., 2023](#)). Together, these interventions create the conditions for more contextualised AIS configurations and support more substantive use of accounting information in financial reporting and decision-making ([Damayanti et al., 2023](#); [Lutfi et al., 2022](#); [Otake, 2022](#)).

The findings further indicate that financial constraints and human resource limitations remain central barriers to AIS implementation. This highlights the need to align the technological context with the organisational realities of MSMEs, particularly in terms

of affordability, ease of use, and internal capacity to operate the system (Januszewski, 2023b; Qi & Ismail, 2019; Utami & Setiawan, 2023). In this regard, the TOE framework can be refined by incorporating modular and scalable AIS solutions within the technological context. Such solutions allow MSMEs to adopt AIS gradually, according to their financial capacity, business complexity, and level of digital readiness (Chouki et al., 2018; Restrepo-Morales et al., 2024).

Managerial competence and support also emerged as critical conditions for successful AIS adoption. This finding reinforces the importance of top management engagement within the organisational context of the TOE framework. Prior studies have similarly shown that leadership plays an important role in technology integration by (Alharasis, 2025; Han et al., 2023) shaping strategic direction, allocating resources, and encouraging employee acceptance. The evidence from this study suggests that the organisational dimension of TOE should give more explicit attention to managerial accounting knowledge, digital capability, and training readiness. These elements are necessary for helping MSMEs navigate the practical complexities of AIS selection, implementation, and integration with existing business processes (Makiwa & Steyn, 2019; Rasdi & Baki, 2025).

The study's emphasis on technological complexity and cloud integration also contributes to a more nuanced understanding of AIS adoption barriers in MSMEs. The findings suggest that the technological context of TOE should not be limited to system availability or perceived usefulness, but should also include system compatibility, integration capacity, and users' digital literacy. Difficulties in connecting AIS with inventory, payroll, sales, and other operational functions indicate that effective AIS implementation depends on seamless data flow across business processes. Without such integration, AIS may remain a partial reporting tool rather than a reliable infrastructure for decision-making and operational control. Future studies could therefore examine more explicitly how system integration and digital literacy interact within the technological dimension of TOE.

Synthesising the empirical barriers identified in the findings, this study suggests that a conventional variable-centred application of TOE may be insufficient to explain AIS implementation among resource-constrained MSMEs. Much of the adoption literature treats technological, organisational, and environmental contexts as parallel determinants with direct effects on adoption. The qualitative evidence in this study points instead to a more conditional process, in which technological availability and environmental pressure are filtered through organisational readiness before they can produce substantive AIS implementation. To clarify this process, the study proposes a mechanism-based adaptive TOE model, as illustrated in Figure 2.

At the centre of this model is the organisational readiness filter. Organisational readiness refers to the internal capacity of MSMEs to absorb, configure, operate, and sustain AIS. It includes financial capacity, managerial accounting competence, human capital, digital literacy, and willingness to change. When this organisational filter is weak, technological availability and environmental pressure are more likely to produce symbolic, fragmented, or discontinued AIS use. In such cases, MSMEs may use AIS only for basic invoicing, compliance reporting, or partial record-keeping, while continuing to rely on manual notes or disconnected systems for key financial decisions.

Conversely, when organisational readiness is sufficiently developed, technological and environmental pressures are more likely to be converted into substantive AIS assimilation. Substantive assimilation occurs when AIS is embedded into routine accounting processes, supports timely and accurate financial reporting, assists managerial decision-making, and strengthens risk mitigation. The proposed model therefore explains not only which barriers affect AIS adoption, but also how these barriers interact to shape different implementation pathways.

This mechanism-based interpretation refines the TOE framework by repositioning the organisational context as a filtering mechanism rather than merely one determinant among others. Technological and environmental factors may generate the need for AIS, but organisational readiness determines whether adoption becomes symbolic and fragmented or substantive and sustainable. The contribution of this model therefore does not lie in proposing an entirely new theory, but in clarifying the conditional mechanism through which TOE factors operate in MSME accounting contexts.

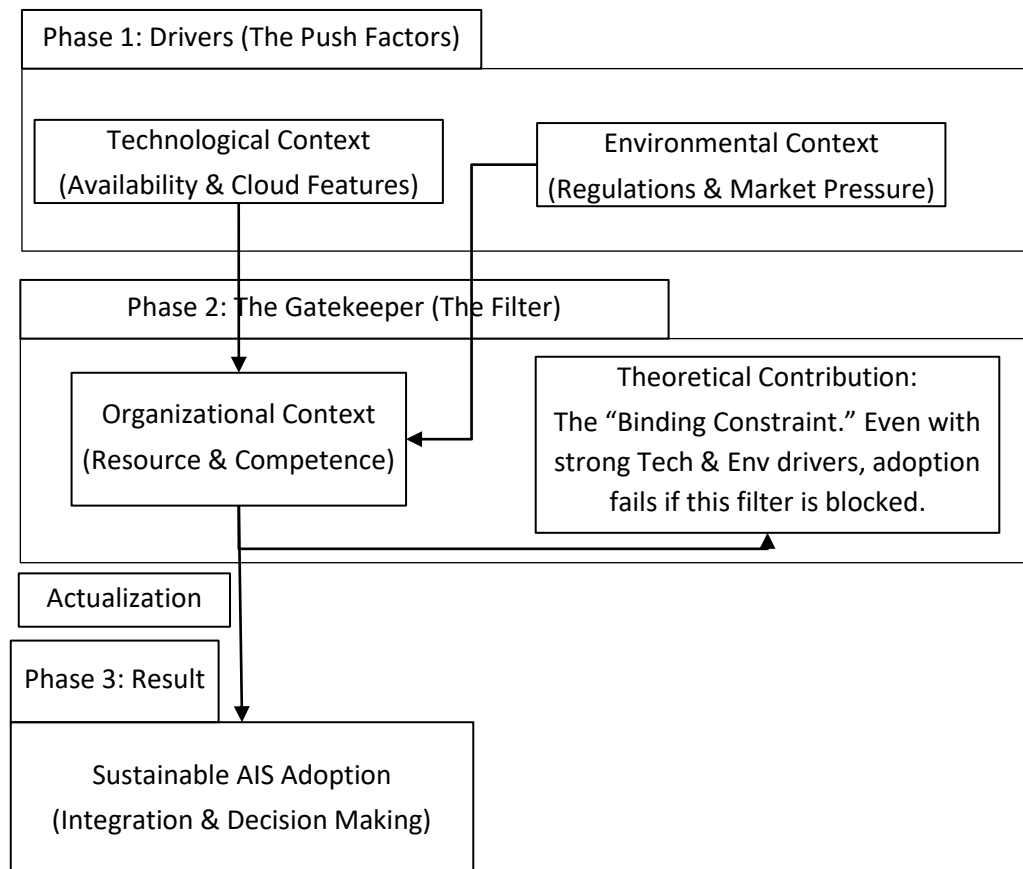


Figure 2. Mechanism-Based Adaptive TOE Model for AIS Implementation in MSMEs

As depicted in Figure 2, the proposed framework operates through a logic of conditional filtration rather than simultaneous correlation. Phase 1, referred to as the drivers, comprises the technological and environmental contexts. Technological factors, such as cloud integration capability, and environmental factors, such as government tax reporting requirements and market competition, create pressure for MSMEs to digitalise

their accounting processes. However, these factors represent enabling or pressuring conditions rather than sufficient conditions for successful AIS implementation.

The central contribution of the model lies in Phase 2, which functions as the organisational gatekeeper. In this phase, the organisational context is conceptualised not merely as one variable among others, but as a binding constraint that filters the influence of technological and environmental drivers. The Resource-Based View explains the internal logic of this filter. MSMEs with limited financial resources, human capital, managerial competence, and digital capability are less able to transform AIS availability into effective accounting practices. Institutional Theory, in turn, explains the external logic of adoption pressure. Regulatory requirements and competitive demands may encourage MSMEs to adopt AIS, but without sufficient internal capability, adoption is likely to remain symbolic, fragmented, or compliance-driven.

By integrating the TOE framework, RBV, and Institutional Theory, the proposed model explains not only what barriers affect AIS adoption, but also how and why these barriers interact to shape implementation outcomes. The framework shows that the potential benefits generated in Phase 1 must pass through the organisational lens, which is shaped by resource availability, managerial competence, digital literacy, and readiness to change. When this organisational filter is weak, for example due to financial illiquidity, limited accounting knowledge, or digital illiteracy, technological and environmental pressures may be neutralised regardless of their intensity. Organisational readiness therefore conditions the extent to which AIS availability and external pressure can be converted into substantive AIS assimilation.

Accordingly, sustainable AIS adoption should be understood as the outcome of organisational readiness in transforming technological and environmental pressures into meaningful accounting practices. This mechanism also clarifies the accounting relevance of the findings. AIS implementation in MSMEs should not be viewed merely as the digitalisation of administrative routines, but as a process that affects the quality and usefulness of accounting information. Resource limitations and insufficient managerial competence weaken the consistency and interpretability of accounting records, as MSMEs may record transactions irregularly, use AIS only for basic documentation, or fail to interpret system-generated reports for managerial purposes.

Technological complexity and fragmented cloud integration further affect the completeness, timeliness, accuracy, and reliability of accounting information. When AIS is disconnected from inventory, payroll, sales, or production systems, financial data may remain scattered across multiple records, increasing the risk of duplicate entries, delayed reporting, and inconsistent financial information. External pressure also has important accounting implications. Regulatory and tax reporting requirements may encourage MSMEs to adopt AIS, but when adoption is driven mainly by compliance and is not supported by adequate organisational readiness, AIS use may remain administrative rather than substantive. In such conditions, the system may help MSMEs satisfy reporting obligations without necessarily improving internal financial monitoring, cash-flow control, inventory management, or risk mitigation.

Conversely, when organisational readiness is stronger, AIS is more likely to be assimilated into daily accounting routines. In this condition, AIS can support more reliable financial reporting, more timely decision-making, greater transparency, and stronger risk control (Darmawan et al., 2026). The framework therefore highlights that the value of AIS

depends not only on system availability, but also on the internal capacity of MSMEs to embed accounting technology into routine managerial and financial practices.

Conclusion

This study examined the challenges faced by micro, small, and medium enterprises (MSMEs) in adopting Accounting Information Systems (AIS) through a qualitative exploratory case study of MSMEs in Bali, Indonesia. The analysis identified six interrelated barriers: technological complexity and limited digital literacy, integration problems in cloud-based AIS, limited managerial competence in accounting and information technology, resource constraints, resistance to change and organisational culture, and external regulatory and market pressures. Interpreted through the Technology–Organisation–Environment (TOE) framework, these findings informed the development of an adaptive AIS implementation framework that explains how technological, organisational, and environmental factors interact in resource-constrained MSME settings.

The findings suggest that conventional policy approaches that rely primarily on sporadic and general digital literacy workshops are insufficient to address the structural barriers identified in this study. In particular, the modified TOE framework shows that organisational readiness functions as a gatekeeper that determines whether AIS adoption becomes symbolic and fragmented or substantive and sustainable. Policy intervention should therefore move beyond general awareness-building and focus more directly on the financial, managerial, and technical constraints that prevent MSMEs from embedding AIS into daily accounting practices.

First, to address resource limitations, fiscal incentives could be designed to reduce the cost of AIS adoption. Experiences from neighbouring emerging economies, such as Malaysia's SME Digitalisation Grant and related digitalisation initiatives, suggest that targeted support for software subscriptions and digital services can reduce entry barriers for smaller firms. In the Indonesian context, a comparable mechanism could take the form of a "digital tax shield", allowing eligible MSMEs to claim enhanced tax deductions or fiscal support for cloud accounting subscriptions, cybersecurity measures, and related digital accounting infrastructure. Such an approach would directly address the cost barrier reported by micro-enterprises in this study and reposition AIS adoption as an investment supported by policy, rather than merely an additional compliance burden.

Second, to address technological complexity and weak system integration, policymakers should consider shifting from generic training programmes to cluster-based digitalisation support. MSMEs should not be treated as a homogeneous group, because accounting needs differ across sectors such as tourism, craft, retail, manufacturing, and services. A cluster-based digital ecosystem would allow support to be tailored to specific business models and operational requirements. For example, tourism MSMEs may require AIS integration with booking platforms and payment systems, while retail and craft businesses may need stronger links between accounting, inventory, and sales records. This approach is consistent with sector-specific digitalisation models, such as

Singapore's SMEs Go Digital programme, which uses industry digital plans to guide firms toward relevant digital solutions.

For Balinese MSMEs, local universities, government agencies, professional accounting bodies, and technology vendors could collaborate to establish digital accounting clinics within key industry clusters. These clinics could serve as technical intermediaries that assist MSMEs in selecting, configuring, and maintaining modular AIS solutions suited to their business needs. Such support would help address the fragmentation problem identified in the findings by ensuring that AIS is not implemented as a stand-alone application, but as part of a broader accounting information infrastructure connected to operational activities.

Future research could extend this study by employing mixed-methods or large-scale survey designs across different regions, industries, and firm sizes. Such studies would allow the proposed adaptive TOE framework to be tested and refined, particularly in relation to the causal relationships among technological readiness, organisational capability, environmental pressure, and substantive AIS assimilation. Comparative studies between different emerging economies, or between MSMEs and larger firms, would also provide deeper insight into how institutional and organisational contexts condition AIS adoption pathways.

Despite its limitations, this study provides a comprehensive and contextually grounded account of AIS implementation barriers among MSMEs in Bali. Its main contribution lies in repositioning organisational readiness as a filtering mechanism within the TOE framework. Technological availability and environmental pressure may create the need for AIS, but organisational readiness determines whether adoption becomes meaningful, integrated, and sustainable. The study therefore offers both theoretical and practical insights for researchers, policymakers, technology providers, and MSME support institutions seeking to strengthen digital accounting transformation in emerging-economy contexts.

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