A Systematic Review of Cloud Accounting Adoption in SMEs: A Thematic Synthesis of Factors, Impacts, and Research Directions

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ABSTRACT

This systematic literature review (SLR) synthesized current research on cloud accounting adoption among small and medium-sized enterprises (SMEs). Guided by the PRISMA protocol and Kitchenham's framework for systematic reviews, thirty peer-reviewed articles published between 2012 and 2025 were analyzed across multiple databases. The review identified supporting and inhibiting factors, impacts, and theoretical underpinnings of cloud accounting adoption. Findings showed that adoption was shaped by a complex interplay of technological, organizational, environmental, and individual factors. Compatibility, scalability, vendor support, and top management commitment consistently emerged as enablers, while cybersecurity risks, limited IT skills, and resistance to change acted as barriers. The impacts of adoption extended beyond operational efficiency to strategic outcomes, including enhanced competitiveness, improved financial decision-making, and business continuity. Moreover, cloud accounting has been conceptualized variably as a dependent, independent, or mediating variable in empirical models. By consolidating these insights, this study advances theoretical understanding and provides practical implications for SMEs, software vendors, and policymakers navigating digital transformation.

Keywords: Cloud Accounting, SMEs, Technology Adoption, TOE Framework, Systematic Literature Review

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INTRODUCTION

Small and medium-sized enterprises (SMEs) are widely recognized as essential contributors to economic growth, job creation, and innovation across both developed and emerging economies (Dlamini & Schutte, 2024; Sastararuji et al., 2022). As digital transformation accelerates, SMEs are increasingly required to adopt new technologies to improve operational efficiency and strengthen competitive advantage. One technology that has gained growing attention is cloud accounting, which offers flexible, scalable, and cost-effective solutions for modernizing financial management, enhancing decision-making, and supporting organizational resilience (Tawfik et al., 2023; Vo Van et al., 2024).

Cloud accounting refers to the use of accounting software hosted on cloud platforms, typically delivered as Software as a Service (SaaS), that allows users to process, store, and access financial data via the internet without the need for on-premises servers or extensive IT infrastructure (Cleary & Quinn, 2016; Rawashdeh & Rawashdeh, 2023). Depending on the level of customization and integration required, it may also involve Platform as a Service (PaaS) or Infrastructure as a Service (IaaS) components (Christauskas & Miseviciene, 2012). These advantages are particularly valuable for SMEs, which often face resource constraints and limited technical expertise (Permatasari et al., 2024).

The advantages of cloud accounting are particularly relevant in contexts where SMEs face resource constraints. Hosting accounting processes in the cloud can reduce the need for dedicated IT staff, lower hardware and maintenance costs, and enhance data security by leveraging the service provider's infrastructure, which often exceeds the security capabilities of in-house systems (Ma et al., 2021; Mauricette et al., 2022). These benefits became even more pronounced during the COVID-19 pandemic, when remote accessibility allowed SMEs to maintain business continuity despite physical restrictions (Mujalli et al., 2024; Sastararuji et al., 2022).

Despite these advantages, adoption remained uneven, especially in emerging economies. Challenges such as cybersecurity concerns, data privacy concerns, limited digital skills, and lack of organizational readiness

continue to impede implementation (Kamal et al., 2023; Tawfik et al., 2023). Interestingly, some factors may have acted as both enablers and barriers depending on the context. Vendor involvement, for example, facilitated adoption through training and support but may havealso created dependency risks (Sastararuji et al., 2022). Similarly, perceived complexity could discourage adoption in SMEs with low digital maturity, yet be considered manageable or even beneficial in digitally advanced firms (Hamundu et al., 2020).

To explain these inconsistencies, past studies have applied various theoretical lenses. The Technology–Organization–Environment (TOE) framework remains the most widely used, highlighting the influence of technological characteristics, organizational capacity, and external pressures (Saad et al., 2022; Tawfik et al., 2023). Other studies drew on the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) to explore user perceptions such as perceived usefulness, ease of use, and behavioral intention (Dlamini, 2025; Permatasari et al., 2024). Strategic constructs such as cloud computing vision have also been introduced to capture how digital transformation aligned with broader business goals (Rawashdeh et al., 2023).

Although research has expanded in recent years, a significant gap remains: there is no comprehensive synthesis that aligned adoption factors, impacts, and variable roles within a unified theoretical framework. Much of the empirical evidence came from emerging economies, where vendor support and government initiatives tended to play a stronger role in influencing adoption compared to advanced economies (Dlamini & Schutte, 2024; Saad et al., 2022). Moreover, the role of cloud accounting in research models was inconsistent. In some studies it was examined as a dependent variable, such as in adoption intention research, while in others it appeared as an independent variable influencing performance, or even as a mediator in broader organizational models (Ma et al., 2021; Rawashdeh & Rawashdeh, 2023).

Given these gaps, a Systematic Literature Review (SLR) remained highly valuable even without additional empirical interviews. SLRs enable the consolidation of dispersed knowledge, reveal methodological and contextual inconsistencies, and provide theory-based insights that can guide

future empirical work. By integrating evidence across studies, an SLR can offer a more comprehensive understanding of cloud accounting adoption, especially in a domain where research remains fragmented across regions, industries, and theoretical approaches.

This study aimed to address these gaps by reviewing peer-reviewed empirical research on cloud accounting adoption in SMEs. Guided by the PRISMA protocol (Page et al., 2021) and the systematic review methodology proposed by Kitchenham et al., (2009), the review explored three core questions:

1. What are the key supporting and inhibiting factors influencing cloud accounting adoption in SMEs globally?

2. What are the perceived impacts or benefits of adoption at the organizational and individual level?

3. How has the role of cloud accounting evolved in empirical studies, whether as an independent, dependent, mediating, or moderating variable?

By systematically mapping the state of the art, this review contributes to academic literature by offering a comprehensive overview of adoption determinants, benefits, and theoretical positioning of cloud accounting in SMEs. For practitioners, the findings highlighted actionable insights for SME owners, software vendors, and policymakers seeking to strengthen digital transformation strategies in the financial domain.

LITERATURE REVIEW

Cloud Accounting and SMEs

Cloud accounting is a major development in the way financial information is managed, combining internet-based accounting software with the capabilities of cloud computing (Christauskas & Miseviciene, 2012). Unlike traditional systems that require installation on company premises and regular maintenance, cloud accounting is hosted on remote servers

and accessed through a web browser. This means that users can work from any location with an internet connection, while the need for expensive IT infrastructure is greatly reduced (Ionescu, 2019). By offering faster access to information, greater accuracy, and more responsive financial processes, cloud accounting has become an essential tool for modern businesses (Khanom, 2017).

SMEs have been among the most active adopters of cloud accounting. This is largely due to its flexibility, scalability, and affordability compared with traditional accounting software. Instead of making a large initial investment in hardware and software, businesses can use subscription-based services that spread the cost over time (Al-Okaily et al., 2023). For SMEs with limited budgets, this approach allows access to powerful accounting features without the burden of maintaining in-house infrastructure. Cloud platforms also make it easier for multiple users to work together in real time, improving collaboration, reducing errors, and ensuring that data is securely backed up on a regular basis (Mohanty & Mishra, 2017).

Security and compliance are other areas where cloud accounting offers strong advantages. Service providers invest heavily in measures such as data encryption, multi-factor authentication, and continuous backups to protect sensitive financial information from cyber threats (Atadoga et al., 2024). Many platforms also update automatically to reflect changes in tax rules or accounting standards, which reduces the compliance workload for businesses (Haleem, 2020). For organizations operating in different regions or countries, these features simplify regulatory management and help prevent costly mistakes.

Most cloud accounting solutions are delivered through the Software as a Service model, although in some cases businesses may also make use of Platform as a Service or Infrastructure as a Service options depending on their needs. The SaaS model reduces the need for complex IT management, offers automatic updates, and can scale up or down as the business changes. Many solutions also integrate seamlessly with other cloud-based tools, creating a connected ecosystem that supports different areas of business operations (Dimitriu & Matei, 2015).

Looking ahead, cloud accounting is expected to evolve alongside other emerging technologies. Artificial intelligence and predictive analytics can enhance automation and provide deeper insights for decision-making. Blockchain integration can improve transparency and traceability in transactions, while the use of Internet of Things devices can offer real-time data on assets and inventory, increasing accuracy in financial reporting (Khanom, 2017). However, as noted by Permatasari et al., (2024), these opportunities also bring new challenges, particularly in the areas of data privacy and cybersecurity, which businesses will need to address.

For SMEs, the value of cloud accounting goes beyond cost savings. It plays a strategic role in helping businesses remain agile and competitive in fast-changing markets (Rawashdeh & Rawashdeh, 2023). With the ability to provide timely financial information and integrate with a wide range of business applications, cloud accounting enables managers to make better decisions and respond quickly to market developments.

In summary, cloud accounting is transforming the way organizations handle their financial processes. Its combination of accessibility, scalability, security, and compliance support makes it an increasingly attractive choice for businesses of all sizes. As the technology continues to mature and merge with other innovations such as artificial intelligence and blockchain, cloud accounting is likely to become an indispensable element of business strategy in the years ahead (Al-Okaily et al., 2023).

Cloud Accounting Adoption Across SMEs Globally

Cloud accounting emerged in the early 2010s as a technological innovation that enabled businesses to manage their accounting processes entirely online. Unlike traditional systems that must be installed and maintained on company premises, cloud accounting allows real-time access to financial data from any location, while supporting automation and collaborative work. This flexibility makes it particularly valuable for SMEs, which often face resource limitations and a lack of specialized technical expertise. For many of these businesses, cloud-based solutions provide an affordable and reliable alternative to conventional accounting systems (Mujalli et al., 2024). As the pace of digital transformation accelerates, cloud accounting has become an important tool for streamlining financial operations, improving efficiency, and supporting better decision-making.

The global market for cloud computing has grown rapidly over the past decade. By 2021, approximately 80 percent of industries in the United States had adopted some form of cloud service, with Europe reaching 70 percent and China 49.4 percent, figures that represent a significant increase compared to previous years (. Chen et al., 2023). This growth was partly driven by the recognition among SMEs of the scalability, accessibility, and cost savings that cloud technologies offer. The COVID-19 pandemic further accelerated adoption, as many businesses sought effective solutions for operating remotely (Pashchenko, 2021). Integration with payroll, tax compliance, and other business management tools has made cloud accounting even more appealing for SMEs seeking an all-in-one financial management platform.

Adoption rates varied widely across regions. Countries such as Australia, the United Kingdom, and New Zealand had taken the lead, supported by robust digital infrastructure and government-backed programs to encourage SME digitization (Bouris et al., 2018; Rehm, 2017). In the United Kingdom, the "Making Tax Digital" initiative had played a central role in driving cloud accounting adoption to meet new tax reporting requirements (Kantar Public, 2021; Sadiq, 2021). In Australia and New Zealand, the success of platforms like Xero had been instrumental in boosting uptake among local SMEs. In contrast, many developing economies still faced slow adoption, hindered by high costs, limited digital infrastructure, and inadequate maintenance support (Al-Okaily et al., 2023).

The global cloud accounting market was dominated by a few major providers offering SME-focused platforms. Xero, QuickBooks Online, Sage Business Cloud, and FreshBooks are among the most widely used solutions worldwide. Xero, which had a particularly strong presence in Australia and New Zealand, reported more than 3.5 million subscribers in 2023 (Radio New Zealand, 2023). QuickBooks Online, developed by Intuit, led in North America and had over 5.6 million users globally (Envoice, 2024). Sage Business Cloud and FreshBooks maintained a strong market position in Europe and North America, offering intuitive interfaces and integration with other business applications (Kirkwood, 2019). Competition among these platforms was based largely on features, ease of use, and pricing flexibility, with many offering free trials or tiered subscription plans to appeal to smaller enterprises. Forbes (2024) ranked the leading platforms as follows:

Table 1: Best Cloud Accounting Software of 2024

No	Cloud Accounting Software	Advantages
1	Freshbooks	Best for overall cloud accounting software
2	Xero	Best for multiple users
3	Zoho Books	Best for a diverse range of solutions
4	Intuit QuickBooks	Best for maximizing tax deductions
5	Wave Accounting	Best for free accounting software
6	Kashoo	Best for easy setup
7	Neat	Best for business with a lot of expenses

Source: Forbes (2024)

Despite its many advantages, the adoption of cloud accounting was not without challenges. In many developing countries, low levels of digital literacy remained a significant barrier. Business owners may lack the skills to implement and manage cloud-based systems, especially those that incorporate artificial intelligence for automation (Rawashdeh & Bakhit, 2023). Financial constraints can also be a hurdle, particularly for micro and small enterprises that struggle to commit to ongoing subscription fees. In addition, although cloud providers employ strong security measures such as encryption and regular backups, some SMEs remained hesitant due to concerns about data privacy and cyber risks.

The outlook for cloud accounting was nonetheless optimistic. As digital transformation became increasingly central to business strategy, more SMEs were expected to adopt cloud-based solutions. Governments and international organizations were introducing incentives to encourage SME digitization, while vendors continue to improve platform accessibility for non-technical users and offer round-the-clock customer support (Chen et al., 2023). These developments suggested that cloud accounting will play an even greater role in supporting business growth, operational resilience, and competitive advantage in the years ahead.

METHODOLOGY

This study employed a SLR to synthesize existing evidence on cloud accounting adoption in SMEs. The methodology was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Page et al., 2021), which ensured a transparent and replicable

review process. The procedure followed established guidelines for evidence-based research in information systems, including recommendations by Kitchenham et al., (2009)

Search Strategy

To identify relevant literature, the review was conducted across four academic databases: **Scopus**, **Web of Science**, **Emerald** and **IEEE**. These databases were chosen due to their broad indexing of high-quality peer-reviewed journals in information systems, accounting, and management disciplines. A Boolean search string was constructed to capture articles related to cloud accounting adoption among SMEs. The search terms combined keywords such as "cloud accounting," "cloud-based accounting," "SMEs," "Small Businesses", "adoption," "implementation," and related synonyms using appropriate Boolean operators (e.g., AND, OR). The specific search string used for each database is documented in Appendix A and can be modified for replication.

The search was limited to:

1. **Language**: English only
2. **Document Type**: Journal articles and conference proceedings
3. **Publication Years**: 2012–2025
4. **Subject Area**: Accounting, Business Management, Information Systems

Inclusion and Exclusion Criteria

After retrieving the initial set of articles, a multi-stage screening process was conducted:

Inclusion criteria:

1. Empirical and non empricial (but complete) studies.
2. Focus on SMEs as the unit of analysis or related to SMEs.
3. Examination of cloud accounting or closely related technologies.
4. Published in peer-reviewed journals or conferences.

Exclusion criteria:

1. Articles unrelated to cloud accounting (e.g., generic cloud computing).
2. Non-SMEs context (e.g., large firms, government, or educational institutions).
3. Non-accounting focus (e.g., ERP, e-commerce unless linked directly to cloud accounting).
4. Non-English language.
5. Duplicate entries across databases.

Screening and Selection Process

The screening process followed four main stages: **identification**, **screening**, **eligibility**, and **inclusion**, as illustrated in the PRISMA flow diagram (Figure 1).

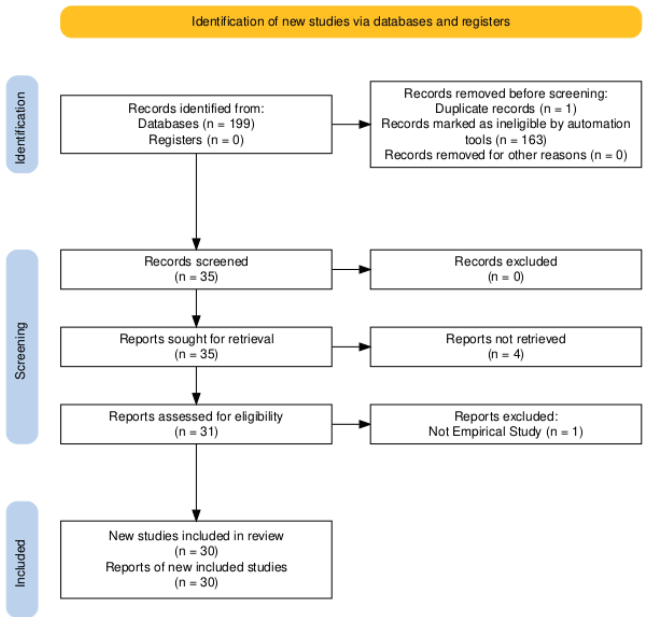

Figure 1: PRISMA Flow Diagram

The initial search yielded a total of 199 articles. After removing duplicates, titles and abstracts were screened for relevance. Full-text screening was then applied to assess eligibility based on the predefined criteria. Finally, a total of 30 articles were included in the final synthesis.

Quality Assessment Using MMAT

To ensure methodological robustness, each included study was assessed using the Mixed Methods Appraisal Tool (MMAT) 2018. This tool is suitable for evaluating quantitative, qualitative, and mixed-method studies within a single framework. Key indicators for assessment included: clear research questions, accurate findings and interpretation (for qualitative studies); a proper target population, appropriate measurements, and statistical analysis (for quantitative studies); and research design and output (for mixed-methods studies). MMAT evaluated studies on five criteria, assigning one point for each criterion fulfilled, yielding a total score between 0 and 5. Two reviewers independently appraised all studies. Differences in ratings were discussed and resolved to ensure consistency.

Most studies scored between 3 and 5, indicating moderate to high methodological quality. A few studies scored lower due to limitations in sample representativeness, unclear data analysis procedures, or insufficient methodological reporting. No study was excluded purely based on the MMAT score. Instead, insights from lower-quality studies were interpreted with caution during thematic synthesis, following best practices in SLR methodology.

Table 2: Summary of MMAT Quality Assessment Results

MMAT Score	Interpretation	Number of Studies
5	High quality	**10**
4	Moderate–high quality	**7**
3	Moderate quality	**10**
2	Low quality (interpreted cautiously)	**3**
1	Very low quality	**0**

Thematic Coding and Synthesis Approach

A structured thematic synthesis was used to analyse the extracted data. This approach followed the framework outlined by Thomas and Harden (2008) and was supported by theoretical triangulation using TOE, TAM, UTAUT, and DOI. The coding unfolded in three iterative stages.

First-cycle: open coding (inductive)

Each paper was read in full and text segments referring to adoption determinants, barriers, impacts, user perceptions, and the role of cloud accounting in empirical models were coded. initial codes were short descriptive labels such as "perceived usefulness," "vendor support," "security concern," "top management support," "organizational readiness," "business continuity," and "decision-making accuracy." for example, mentions of automated updates, real-time access, and system flexibility were coded as "cloud computing characteristics" while references to encryption, breaches, and data ownership were coded as "security/privacy."

Second-cycle: axial coding (category building)

Related first-cycle codes were grouped into broader, conceptually coherent categories. technological sub-codes (e.g., "compatibility," "scalability," "integration issues") were assembled under a higher-order theme labeled technological factors. organizational sub-codes (e.g., "top management support," "training," "digital skills") formed organizational factors. environmental and user-level codes likewise formed environmental factors and individual/user factors, respectively. impact-related codes were grouped into organizational impacts (efficiency, competitiveness, continuity) and individual impacts (usability, decision accuracy). This stage reduced code redundancy and made cross-study comparisons tractable.

Third-cycle: selective coding (theory alignment and synthesis)

The emergent categories were mapped onto formal theoretical constructs to ensure conceptual clarity and to strengthen theoretical contribution. The mapping followed these principles:

1. **Technological categories** → mapped to the technological context of TOE (e.g., compatibility, complexity, scalability, security).

2. **Organizational categories** → mapped to the organizational context of TOE (e.g., top management support, skills, readiness).

3. **Environmental categories** → mapped to the environmental context of TOE (e.g., competition & customer pressure, regulation).

4. **Individual/user categories** → mapped primarily to TAM/UTAUT constructs (e.g., perceived usefulness, trust, skills → performance expectancy; perceived ease of use → effort expectancy).

5. **Diffusion of Innovations (DOI)** constructs (e.g., complexity, trialability, relative advantage) were used when studies discussed innovation characteristics.

This triangulation allowed each theme to be interpreted both in empirical terms (what studies report) and in theoretical terms (how these observations relate to adoption theory).

To make the synthesis more systematic and transparent, frequency counts were produced showing how often each theme appeared across the 30 studies. These counts informed the relative weight of themes in the literature:

1. **Security / privacy concerns:** 20 of 30 studies. Security issues were the most frequently reported inhibitor across contexts (e.g., Dlamini, 2025; Tawfik et al., 2023).

2. **Perceived usefulness / performance expectancy:** 18 of 30 studies. Frequently cited as a primary motivator (e.g., Mauricette, 2022; Permatasari et al., 2024).

3. **Organizational readiness (skills, infrastructure):** 17 of 30 studies. Readiness consistently predicted adoption or quality of use (e.g., Mujalli et al., 2024; Putri et al., 2025).

4. **Vendor support / external assistance:** 16 of 30 studies. Especially salient in emerging-economy samples (e.g., Ma et al., 2021; Sastararuji et al., 2022).

5. **Government / regulatory influence:** 11 of 30 studies. Appears more often where active policy or tax initiatives exist (e.g., Kantar Public; Huy & Phuc, 2025).

These counts clarified which themes were widely supported and which were less frequent, addressing reviewer concerns about transparency and

the strength of evidence. Some determinants appeared as both enablers and inhibitors depending on contextual conditions. To preserve nuance, such themes were coded in two ways:

1. **Directional sub-coding** - each instance was coded as either a supporting mention (e.g., "security features increased trust") or an inhibiting mention (e.g., "security concerns deter adoption").

2. **Contextual tagging** - each coded instance received contextual tags (e.g., country, sector, sample type, year) so the synthesis could explain when and why the direction flips. For example, vendor support often functioned as an enabler in studies from Indonesia and Zimbabwe (Permatasari et al., 2024; Dlamini, 2025), whereas vendor lock-in concerns appeared in samples with weak competition among software providers.

The coded dataset was analyzed for cross-cutting patterns:

1. **Temporal trends:** Early studies (pre-2018) emphasize technological feasibility and security; COVID-era studies (2020–2022) emphasized remote access and business continuity; recent studies (2023–2025) increasingly linked cloud accounting to strategic outcomes such as sustainability and digital transformation.

2. **Geographic variation:** The majority of empirical work was situated in emerging economies, where vendor support and government incentives commonly appeared; studies from developed economies focused more on performance and integration (e.g., Asatiani, 2019; Ma et al., 2021).

3. **Industry differences:** Most studies were cross-sectoral; where sector-specific analyses exist (e.g., F&B in Permatasari et al., 2024; manufacturing in Wang, 2020), particular concerns about integration or compliance surface.

The final coding structure was condensed into a conceptual visual framework that grouped technological, organizational, environmental, and individual factors and linked them to organizational and individual impacts.

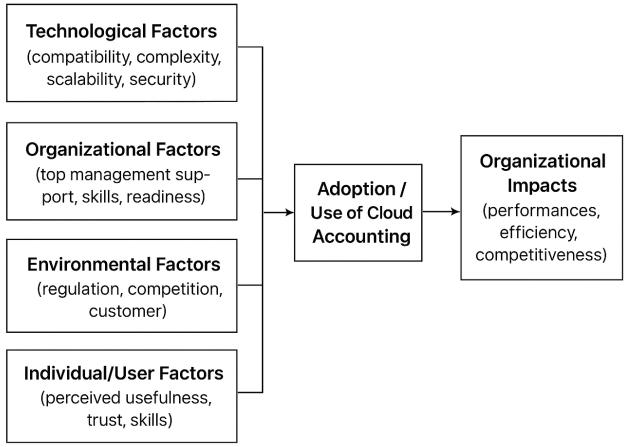

Figure 2: Conceptual Visual Framework

To ensure transparency in how themes were developed, this review systematically constructed all themes through a structured coding and synthesis process, beginning with open coding, followed by axial grouping, and ending with selective alignment to TOE, TAM, UTAUT, and DOI frameworks. Each determinant, barrier, or impact was coded across all 30 included studies, and frequency counts were generated to show the strength of evidence supporting each theme. For example, security and privacy concerns appeared in 20 studies, perceived usefulness and performance expectancy in 18 studies, organizational readiness in 17 studies, vendor support in 16 studies, and government or regulatory influence in 11 studies. These counts demonstrated how widely each theme was represented in the literature and clarified the weight of evidence behind the synthesized findings. By integrating qualitative thematic development with quantitative frequency analysis, this review moved beyond descriptive summarization and provided a more rigorous, evidence-based thematic structure.

RESULTS AND DISCUSSION

This section presents the results of the SLR and provides an integrated discussion of the findings. In total, thirty studies were examined, spanning different regions, industries, and methodological approaches. The descriptive

overview outlines the main characteristics of the reviewed studies, including research methods, theoretical perspectives, and contextual settings, offering a foundation for interpreting broader trends. The subsequent discussion builds on this analysis by identifying recurring patterns in adoption factors, theoretical alignments and tensions, as well as practical implications for SMEs, vendors, and policymakers. Together, these insights not only capture how cloud accounting adoption has been studied to date but also highlight areas where further exploration is needed.

Publication Year Trend

The distribution of publications over time indicated increasing scholarly interest in cloud accounting adoption among SMEs. While early studies were sparse, there had been a noticeable surge in publications beginning around 2020, peaking in the years following the COVID-19 pandemic. This trend reflected the growing recognition of cloud accounting as a critical digital solution for SMEs navigating post-pandemic business environments.

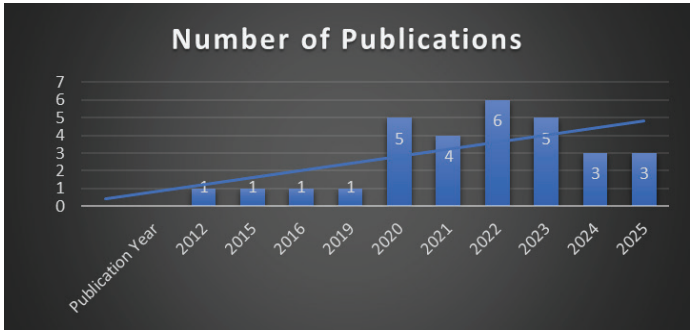

Figure 3: Publication Year Trend

Evolution of research over time

A temporal analysis of the included studies (2012–2025) revealed a clear evolution in research emphasis, corresponding to changes in technological maturity, external pressures, and strategic priorities within SMEs.

Early period (2012–2017)

Examples: Christauskas (2012), Cleary (2016).

Research during this period primarily explored the foundational feasibility of cloud-based systems. Themes centered on the technical characteristics of cloud accounting, including flexibility, accessibility, and automation. Security, trust, and data ownership concerns were consistently highlighted as the most salient barriers. Overall, studies adopted a predominantly technical lens, positioning cloud accounting as an emergent innovation whose risks and basic capabilities required evaluation.

Pre-COVID to COVID Era (2018–2022)

Examples: Asatiani (2019), Lin Chen (2020), Jiao Feng (2015), Wang (2020), Ma (2021), Hamundu (2021–2022), Sastararuji (2022).

With the broader digitalization trend and the pressures of the COVID-19 pandemic, research shifted towards operational themes. SMEs increasingly relied on cloud accounting for remote access, workflow continuity, and collaboration. Studies emphasized integration challenges, the role of vendor support, and the need for reliable infrastructure. The pandemic period especially accelerated adoption due to business continuity requirements, making cloud technologies not merely optional but operationally essential.

Post-2023 (2023–2025)

Examples: Tawfik (2023), Rawashdeh (2023), Permatasari (2024), Hien Vo (2024), Dlamini (2025), Huy (2025).

Recent studies reflected a more strategic orientation. Cloud accounting was now examined as a driver of organizational performance, competitive advantage, and digital transformation. Research highlighted advanced impacts such as improved decision-making accuracy, sustainability integration (e.g., Pham Quang Huy, 2025), and enhanced strategic agility. This period demonstrated a shift from operational functionality to strategic capability, with cloud accounting increasingly embedded within broader digital transformation frameworks.

Country and regional distribution

The reviewed studies span multiple countries across Asia, the Middle East, Europe, Oceania and Africa. Notably, there is a concentration of research from countries such as Jordan and Indonesia, reflecting strong academic and practical interest in digital transformation within these

regions. However, certain regions such as North and Latin America remained underrepresented, indicating opportunities for future research to expand geographical coverage. Notably, the majority of studies (25 out of 30) originated from emerging economies, reflecting a strong research interest in how SMEs in resource-constrained environments navigate digital transformation. In contrast, only a few studies were based in advanced economies, indicating that cloud accounting adoption may be considered more mature or less explored as a research gap in those contexts.

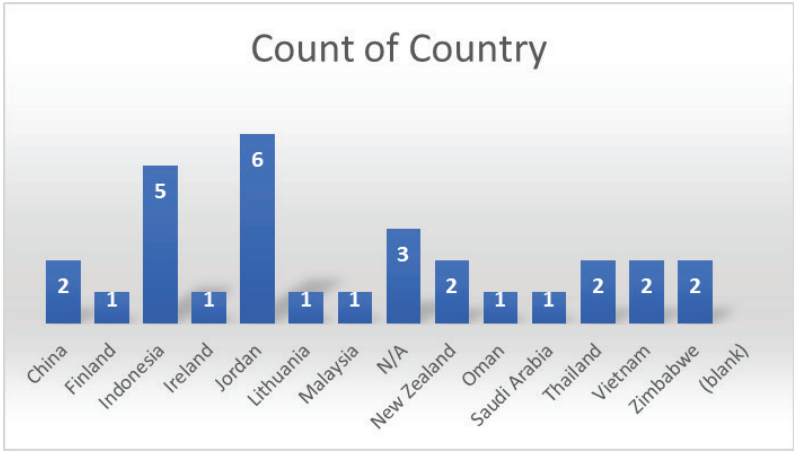

Figure 4: Countries Represented

Geographical differences

The 30 studies spanned Asia, the Middle East, Europe, Africa, and Oceania, revealing region-specific determinants and contextual pressures.

1. **Middle East (Jordan, Oman, Saudi Arabia)**
   Studies: Al-Okaily, Saad, Rawashdeh, Tawfik, Mujalli and others.

   Middle Eastern research consistently highlighted the role of government intervention, institutional pressures, and vendor-provided training. Security and privacy concerns remain dominant inhibitors. Models such as UTAUT were frequently applied due to their emphasis on performance expectancy and social influence. SMEs in this region appeared highly dependent on external regulatory clarity and vendor guidance.

2. **Southeast Asia (Indonesia, Vietnam, Malaysia, Thailand)**
Studies: Tandiono, Pramuka, Hamundu, Permatasari, Kamal, Hien Vo, Sastararuji

Key constraints included low digital literacy, infrastructure limitations, and resource scarcity. Perceived usefulness was a strong driver, but readiness and capability gaps frequently inhibit adoption. Cost, financial resources, and training limitations appeared more prominently in Southeast Asian contexts compared to other regions.

3. **East Asia (China)**
Studies: Lin Chen, Wang.

Studies from China emphasized integration with taxation systems, the scalability and flexibility of cloud solutions, and improved decision-making accuracy. System integration challenges, particularly in manufacturing and service sectors, were mentioned more often than in other regions, highlighting unique institutional and technological dynamics.

4. **Europe & Oceania (Finland, Ireland, New Zealand)**
Studies: Mauricette, Asatiani, Cleary, Ma.
These studies focused on system quality, accuracy, content, reliability and the productivity effects of cloud accounting. Automation, reduced manual processes, and workflow efficiencies were frequently highlighted. Unlike emerging economies, government support plays a minimal role. Cloud accounting was viewed as a mature system that enhanced organizational performance rather than a technology requiring justification or external incentives.

5. Africa (Zimbabwe)
Studies: Dlamini (2025; two studies).

African SMEs faced significant barriers including limited IT infrastructure, financial constraints, and weak digital capabilities. Vendor support was especially critical for adoption, given skill gaps and technical challenges such as data migration and system accuracy. Despite these barriers, expected benefits, such as decision-making enhancement and efficiency gains, remained strong motivators.

Industry Differences

Most studies adopted a cross-sectoral perspective; however, several provided insights into industry-specific conditions that shape adoption dynamics.

1. **Manufacturing (e.g., Hien Vo 2024; Sastararuji 2022; Wang 2020)**
   Manufacturing-oriented studies often emphasized integration complexity, system scalability, and real-time accuracy needs. Cloud accounting was recognized for improving operational control and enhancing production and financial visibility.

2. **Food & Beverage, Retail, Fashion (e.g., Permatasari 2024; Dlamini 2025)**
   These sectors highlighted ease of use, inventory and sales management benefits, and digital skill constraints. The simplicity of interfaces and the usefulness of cloud tools for transaction-intensive environments were frequently emphasized.

3. **Professional Accounting Firms (Mauricette 2022; Ma 2021)**
   Themes included content quality, accuracy, and improved client responsiveness. Cloud systems enhanced workflow efficiency and expanded service capabilities, indicating higher expectations of system quality and integration within professional settings.

4. **Education & Public Services (Kamal 2023)**
   Studies in this sector highlighted top management support, competitive pressure, and the need for enhanced training. Adoption was driven by modernization initiatives, though limited digital infrastructure remained a challenge.

   While some industry-specific factors emerged, the majority of studies positioned cloud accounting as a universally applicable digital capability with benefits and challenges consistent across sectors.

Research Methods

Among the 30 studies, the majority employed quantitative approaches, followed by qualitative case studies and a few mixed-method designs.

Quantitative methods were often used to validate models based on frameworks such as UTAUT, TAM, or TOE, typically via survey-based instruments. Qualitative studies, on the other hand, offered deep insights into organizational context and user perceptions through interviews or case studies. The diversity in methods reflected the multi-faceted nature of technology adoption research.

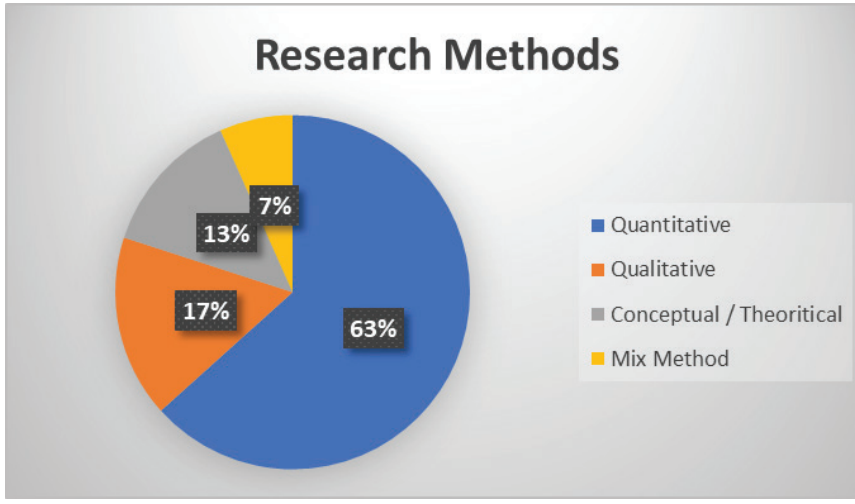

Figure 5: Research Method Distribution

Theoretical Frameworks

The studies relied on a variety of theoretical models to frame the analysis of cloud accounting adoption. The Technology–Organization–Environment (TOE) framework was the most commonly used, followed by the Technology Acceptance Model (TAM), and the Unified Theory of Acceptance and Use of Technology (UTAUT). Some studies also incorporated hybrid models or emerging constructs such as Dynamic Capabilities (DC) or End-User Computing Satisfaction (EUCS). The choice of framework often reflected the research focus, whether on individual user behavior, organizational readiness, or environmental influences.

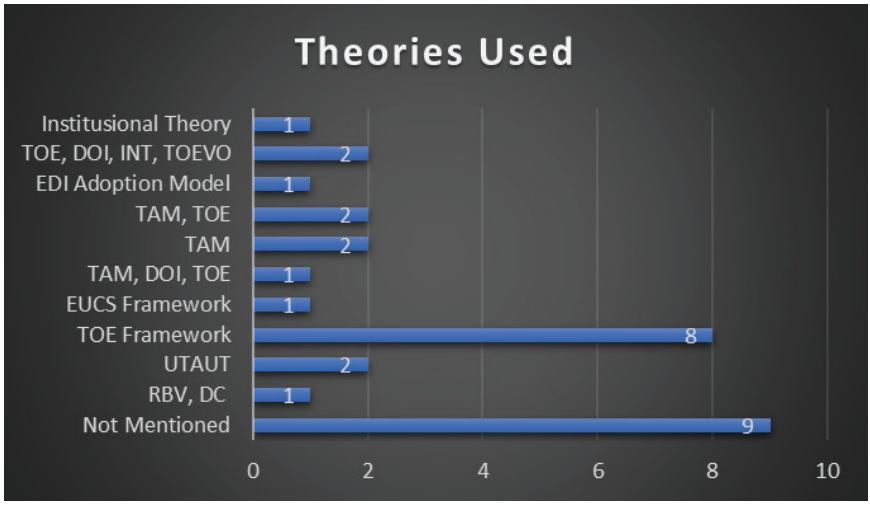

Figure 6: Frequency of Theories Used

This diversity in theoretical perspectives provided a comprehensive understanding of the different dimensions influencing cloud accounting adoption. However, it also presented challenges in comparing results across studies, suggesting the need for greater theoretical consolidation or integrated frameworks in future research.

In summary, the descriptive analysis highlighted a growing body of literature on cloud accounting adoption in SMEs, characterized by methodological variety and geographic diversity. The findings reinforced the relevance of the topic and lay the foundation for the thematic synthesis presented in the following section.

Integrating TAM, UTAUT, and DOI

The review demonstrated that psychological factors from TAM and UTAUT didnot operate separately from organizational factors; instead, they complemented TOE constructs.

TAM and UTAUT contributions

1. Perceived usefulness (TAM) = relative advantage (TOE/DOI)
2. Ease of use (TAM) = reduces perceived complexity (TOE/DOI)
3. Performance expectancy, effort expectancy, facilitating conditions

(UTAUT) = align with technological and organizational readiness within TOE

4. Social influence (UTAUT) often overlaps with environmental pressures (TOE)

This integration showed that adoption was not only a technical or structural decision, but also a cognitive and perceptual process shaped by SME owners' beliefs.

DOI contributions

DOI helped explain the temporal evolution found in this review:

1. Early studies emphasized complexity and trialability
2. COVID-era studies emphasized observability and relative advantage during crisis
3. Recent studies highlighted compatibility with strategic goals such as ESG, transformation, and growth

Thus, cloud accounting transitions from being viewed as an innovation to becoming a strategic capability.

Supporting & Inhibiting Factors (T-O-E framework)

A thematic synthesis of the reviewed studies was conducted, guided by the Technology–Organization–Environment (TOE) framework. The identified factors were classified into three broad domains: technological, organizational, and environmental, with an additional user-centric dimension emerging across studies—the individual level.

Table 3: Supporting and Inhibiting Factors

TOE Domain	Supporting Factors	Inhibiting Factors
Technological	Cloud Computing Characteristics, Compatibility, Scalability, Reliability, System Flexibility	Complexity, Technical Difficulties, System Integration, Data Migration Challenges, Cybersecurity Risk
Organizational	Top Management Support, Owner Support, Government Support, Organization Size, Informal Network, Vendor Support, Competitive Pressure, Covid-19 Pandemic	Organizational Culture, Limited IT Infrastructure, Lack of Training, Internet Connection, Vendor Lock-in

TOE Domain	Supporting Factors	Inhibiting Factors
Environmental	Customer Pressure, Regulatory Pressure (if implied), Competitive Pressure	Regulatory Uncertainty (if any), Market Fragmentation (if inferred)
Individual/ User	Content Quality, Effort Expectancy, Facilitating Conditions, Perceived Ease of Use, Perceived Usefulness, Performance Expectancy, Social Motivation	Perceived Risk, Perceived Trust, Lack of Awareness, Usability Concerns

Among the most prominent technological enablers, compatibility of cloud systems with existing business processes was frequently emphasized (Hamundu et al., 2020; Rawashdeh et al., 2023; Tawfik et al., 2023). Other key technological drivers included system scalability, reliability, and the core advantages of cloud computing characteristics such as real-time access, automation, and mobility. These features made cloud accounting particularly attractive to SMEs lacking sophisticated IT infrastructure (Cleary & Quinn, 2016; Hamundu et al., 2020; Wang, 2020). However, technological inhibitors were equally prevalent. Studies revealed that perceived complexity, technical integration issues, system migration challenges, and cybersecurity risks often deterred SMEs from adopting cloud accounting platforms (Hamundu et al., 2020; Permatasari et al., 2024; Sastararuji et al., 2022). These concerns were intensified when SMEs lack in-house technical expertise or faced data protection constraints under local regulation.

At the organizational level, top management support, owner commitment, and internal leadership education consistently emerged as critical success factors (Hamundu et al., 2020; Saad et al., 2022; Sastararuji et al., 2022). SMEs with strong informal networks, larger organizational size, and external vendor collaboration were also more likely to implement cloud systems effectively (Hamundu et al., 2020; Saad et al., 2022). Nevertheless, several organizational barriers persisted. Studies identified organizational resistance to change, lack of internal training, and limited IT infrastructure as core challenges, particularly in emerging economies (Dlamini & Schutte, 2024; Tawfik et al., 2023). The COVID-19 pandemic, while a catalyst for some firms, also exposed gaps in readiness for digital transformation.

The external environment played a dual role. On the supporting side, customer and competitive pressure often pushed SMEs to adopt cloud technologies in order to meet stakeholder expectations and market demands

(Ma et al., 2021; Saad et al., 2022). Government support and favorable policy environments were also cited, albeit inconsistently across countries (Hamundu et al., 2020; Sastararuji et al., 2022). Conversely, in contexts where regulatory frameworks were unclear or inconsistent, adoption was hindered. For example, vendor lock-in, market fragmentation, or lack of regulatory enforcement can discourage smaller firms from transitioning to cloud platforms (Vo Van et al., 2024).

Beyond organizational structures and systems, user perceptions also strongly influenced adoption behavior. Positive drivers included effort expectancy, facilitating conditions, perceived usefulness, and performance expectancy were factors rooted in TAM and UTAUT models (Lutfi, 2022; Mujalli et al., 2024; Permatasari et al., 2024). These were especially relevant for owner-managers and accountants within SMEs who were the primary system users. However, studies also highlighted user-level inhibitors such as perceived security risk, trust issues, and lack of awareness or understanding of cloud accounting solutions (Al-Okaily et al., 2023; Asatiani et al., 2019; Christauskas & Miseviciene, 2012).

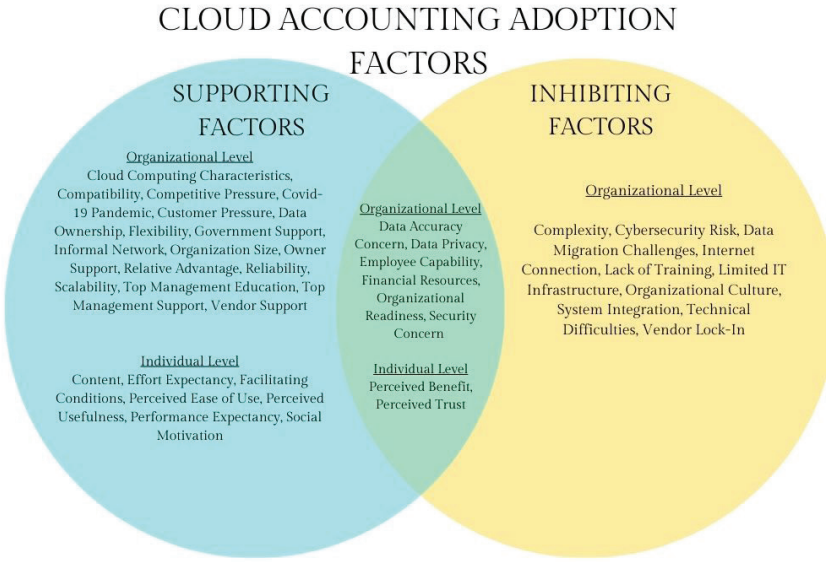

Figure 7: Cloud Accounting Adoption Factors – Venn Diagram

Impacts (organizational vs. individual level)

The review also showed that adoption outcomes spanned both organizational and individual domains. At the organizational level, cloud accounting adoption was most commonly linked to improved operational performance, increased efficiency, and enhanced competitiveness. Several studies reported that cloud-based systems contributed to better financial management, cost reduction, and productivity gains by automating manual tasks and streamlining financial workflows (. Chen, 2020; Christauskas & Miseviciene, 2012; Feng, 2015). For example, real-time access to data facilitated faster financial decision-making, while centralized platforms supported multi-location business operations.

Further, cloud systems supported business continuity and digital transformation, especially relevant during crisis periods such as the COVID-19 pandemic. Some studies also associated cloud adoption with risk early warning, better tax and compliance management, and stronger sustainability practices (. Chen, 2020; Dlamini, 2025; Huy & Phuc, 2025). These impacts suggested that cloud accounting played a strategic role, far beyond mere record-keeping.

At the individual level, perceived benefits included improved usability, accessibility, flexibility, and decision-making accuracy. Users appreciated cloud platforms for enabling remote access, user-friendly interfaces, and integration with mobile devices, which together increased their daily productivity (Dlamini, 2025; Lutfi, 2022; Ma et al., 2021). These benefits aligned with constructs such as effort expectancy and performance expectancy com-monly used in TAM and UTAUT frameworks.

Cloud systems also enhanced the accuracy of financial data, minimized manual errors, and improved users' trust in reported numbers, also contributing to greater confidence in both operational and strategic decisions (Huy & Phuc, 2025; Mujalli et al., 2024; Yu & Tang, 2020). For many SMEs users, this translated into a more empowering and intuitive accounting experience.

To illustrate the spread of identified impacts, the following visualisations are provided:

Table 4: Categorization of Cloud Accounting Impacts by Level

Level	Impact Items
Organizational Level	Increased AIS Effectiveness Organizational Performance Improve Financial Management Improve Tax Management Risk Early Warning Reduced Costs Enhance Financing Capacity Enhance Competitiveness Integration Enhance Productivity Increased Efficiency Business Continuity Accelerate Digital Transformation Improve Management Support Sustainability Organizational Income Grow Business Backup Data Reach More Customers
Individual Level	Enhance Decision Making Accuracy Accessibility Data Security Data Accuracy Enhance Speed Reduced Paper Work Flexibility Scalability

Figure 8: Word Cloud of Impact Terms

The word cloud highlighted high-frequency impact themes such as efficiency, performance, accuracy, competitiveness, and productivity. These keywords visually affirmed the centrality of these outcomes in cloud accounting adoption discussions. Overall, the findings indicated that cloud accounting offered both strategic organizational benefits and operational user-level enhancements. These dual impacts made cloud adoption an increasingly attractive option for SMEs seeking agility, transparency, and data-driven decision-making (Khayer et al., 2020; Kumar et al., 2024; Yu & Tang, 2020).

Variable Position (independent, dependent, mediating, etc.)

The review examined how cloud accounting had been conceptualized and positioned within empirical models across the selected studies. The analysis identified four primary roles: independent variable, dependent variable, mediating variable, and not explicitly specified.

The majority of studies (16 out of 30) conceptualized cloud accounting as a dependent variable, typically within adoption frameworks such as TAM, TOE, or UTAUT. These studies focused on identifying the key determinants that influence the intention or decision to adopt cloud-based accounting systems. Common predictors included perceived usefulness, ease of use, top management support, IT readiness, government support and other factors (Dlamini, 2025; Hamundu et al., 2020; Kamal et al., 2023; Pinasti & Pramuka, 2020). This indicated that cloud accounting was still predominantly explored in terms of its uptake rather than its consequences.

In contrast, a smaller group of studies (5 papers) treated cloud accounting as a mediating variable. In these models, cloud accounting adoption acted as a bridge that linked organizational characteristics or external pressures to outcomes such as performance, competitiveness, or sustainability (Huy & Phuc, 2025; Ma et al., 2021; Rawashdeh & Rawashdeh, 2023). This highlighted a more integrative approach where cloud accounting was seen as a strategic enabler rather than a standalone decision.

Only 2 studies positioned cloud accounting as an independent variable, primarily in the context of investigating its effect on business outcomes

such as organizational performance and efficiency or AIS effectiveness (Cleary & Quinn, 2016; Vo Van et al., 2024). These papers suggested a more mature research orientation where cloud systems were embedded in broader performance frameworks.

Finally, 7 studies discussed cloud accounting without explicitly defining its variable role. These were mostly qualitative or exploratory in nature, focusing on user perception, contextual analysis, or implementation issues without formal hypothesis testing or model positioning.

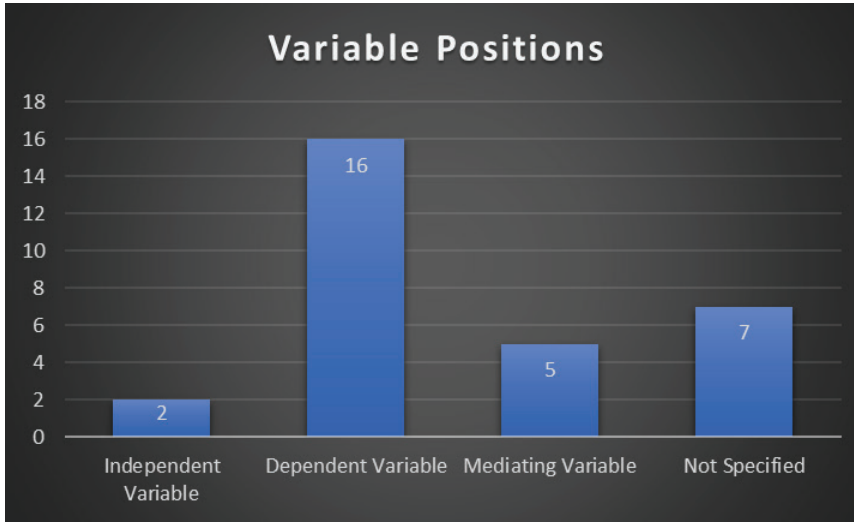

Figure 9: Variable Positions in Reviewed Studies

The figure shows a clear dominance of the dependent variable role, reflecting the field's current focus on understanding what drives adoption. However, the emergence of mediating and independent roles points to a growing recognition of cloud accounting's broader organizational significance. As the research matures, future studies may benefit from adopting multi-level or longitudinal models that explore not only adoption triggers but also post-adoption impacts and system integration over time.

Toward a Conceptual Model

Based on the synthesis, we proposed a conceptual model in which:

1. TOE factors function as primary antecedents of cloud accounting adoption.
2. Individual/user perceptions from TAM and UTAUT served as mediating mechanisms that translated technological and organizational conditions into behavioral intention.
3. Environmental factors moderated these relationships, especially in emerging markets.
4. Cloud accounting adoption mediated the relationship between organizational readiness and SME performance outcomes such as efficiency, competitiveness, data quality, decision-making accuracy, and sustainability.
4. Digital literacy and regulatory clarity emerged as structural moderators, shaping the strength of adoption drivers.

This model positioned cloud accounting not merely as a technological tool but as a capability embedded in broader SME digital transformation.

Overall Interpretation

The SLR showed that cloud accounting adoption research had matured significantly:

1. From technical feasibility → to operational continuity → to strategic performance enhancement.
2. From isolated determinants → to integrated, multilevel frameworks.
3. From descriptive studies → to theoretically anchored, performance-oriented analyses.

By linking the findings to TOE, TAM, UTAUT, and DOI, this discussion provides a robust theoretical foundation and elevates the contribution of the review beyond mere summarization to a structured and theory-informed explanation of how and why SMEs adopt cloud accounting.

Although this review provided an integrated conceptual model based on rigorous synthesis of 30 empirical studies, it did not include primary data collection. The model therefore represented a theoretically informed framework that reflected patterns across the existing literature, but it had not yet been empirically tested in real organizational settings. Future research should validate and refine this model through qualitative approaches such as interviews or case studies to explore causal mechanisms in depth, and through quantitative methods such as surveys or SEM to examine the strength of relationships among technological, organizational, environmental, and individual factors. These empirical efforts will be essential to confirm the model's applicability across different industries, regions, and SME contexts, and to ensure that the theoretical propositions emerging from this review translate into practical, evidence-based insights for cloud accounting adoption.

CONCLUSION

This study set out to synthesize the existing body of empirical research on cloud accounting adoption in SMEs using a SLR approach. Drawing on 30 peer-reviewed articles pub-lished between 2012 and 2025, the review explored three core research questions: (1) What are the key supporting and inhibiting factors influencing cloud accounting adoption in SMEs globally? (2) What are the perceived impacts or benefits of cloud accounting adoption at both the organizational and individual level? and (3) How has cloud accounting been positioned in empirical research as an independent, dependent, mediating, or moderating variable? The review revealed that cloud accounting adoption in SMEs was shaped by a complex interplay of technological, organizational, and environmental factors. Technological compatibility, vendor support, and system scalability were found to be major enablers, especially in resource-constrained contexts. Conversely, cybersecurity concerns, lack of digital literacy, and organizational resistance to change emerged as consistent barriers. The impacts of adoption were found to span both strategic (e.g., increased efficiency, cost savings, enhanced competitiveness) and operational (e.g., decision-making accuracy, accessibility, user satisfaction) levels. The frequency analysis further highlighted that security concerns, perceived usefulness, and organizational readiness were the most consistently reported themes across the literature,

confirming their centrality in shaping adoption outcomes. The analysis also highlighted the evolving role of cloud accounting in empirical models, with most studies treating it as a dependent variable, though some explored its mediating or performance-linked function.

This review contributes to academic literature by offering a consolidated understanding of how cloud accounting adoption is studied, measured, and modeled in the SMEs context. It mapped out key variables, theoretical alignments, and outcomes, providing a foundation for future empirical investigations. By synthesizing findings through the integrated lenses of TOE, TAM, UTAUT, and DOI, the study demonstrated how technological perceptions, organizational capabilities, environmental pressures, and user-level factors jointly influenced adoption behaviors. By classifying adoption factors using the TOE lens and identifying gaps in behavioral and post-adoption research, this study paves the way for richer theoretical development and more robust methodological approaches. For practitioners, the review provides actionable insights for SMEs owners, cloud solution vendors, and policymakers. It reinforces the importance of usability, trust, and support in promoting adoption and highlights the strategic role of cloud accounting in business resilience and digital transformation.

Future studies could explore cloud accounting adoption in a more industry-specific manner, examining how sectoral regulations, workflows, or customer expectations influence implementation. comparative research across regions or economic tiers such as between developed and emerging economies could further illuminate how environmental factors shape adoption differently. furthermore, researchers are encouraged to design mixed-method frameworks that integrate qualitative insights with quantitative modeling, especially in studying long-term impacts, behavioral change, and post-adoption integration. As this review synthesized existing evidence without primary data collection, future research should empirically validate the proposed conceptual model through interviews, surveys, or case studies to test its applicability across diverse SMEs contexts. As SMEs continue to face the pressures of digital transformation, understanding and optimizing cloud accounting adoption will remain a critical area of academic and practical interest. This review aimed to serve as a launchpad for future inquiry that is both rigorous and impactful.

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