

Digital Accounting Systems in Small Retail Enterprises: A Systematic Review of Cost-Benefit Analysis

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Abstract

This systematic review investigates the cost-benefit dynamics of digital accounting systems (DAS) adoption in small retail enterprises. It aims to address the critical information asymmetry faced by these businesses by deconstructing the cost structures, quantifying the multi-dimensional benefits, and identifying optimal implementation strategies across three key subsectors: convenience stores, hardware stores, and new retail formats (e.g., unmanned kiosks). The study employs a systematic literature review methodology, synthesizing evidence from 34 academic articles and case studies, supplemented by meta-analysis to derive industry-wide performance benchmarks. The analysis reveals significant subsector-specific disparities. Cost structures range from lightweight SaaS subscriptions in convenience stores to integrated inventory-accounting modules in hardware stores and scenario-specific deployments in new retail. Quantifiable benefits are substantial, demonstrating 30-80% labor cost savings, 18-28% inventory turnover improvements, and near-elimination of compliance penalties. One of the main findings is that an organization's digital readiness has a positive effect on benefit realization. Consequently, the “one-size-fits-all” approach is ineffective. The synthesized optimization strategy emphasizes “contingent customization”: convenience stores should prioritize multi-store data consolidation, hardware stores require inventory-finance integration, and new retail needs automated bookkeeping for high-frequency transactions. In conclusion, this review constructs a differentiated cost-benefit framework that moves beyond generic models. It provides small retail decision-makers with actionable, evidence-based guidance for system selection and implementation, advocating for tailored solutions that align with specific operational profiles and strategic objectives to maximize return on digital investment.

Keywords

digital accounting systems, small retail enterprises, cost-benefit analysis, systematic review, contingent customization

1. Introduction

Small retail enterprises face a critical challenge in the digital era: evaluating Digital Accounting Systems (DAS) amid significant information asymmetry [1]. Owners often lack clarity on total costs beyond

subscription fees, struggle to quantify multi-dimensional benefits, and miss format-specific benchmarks, leading to suboptimal decisions that hinder competitiveness.

The shift to digital accounting is accelerated by the digital economy and supportive policies, becoming a strategic necessity for retail SMEs [2]. Research confirms DAS can dramatically improve efficiency (e.g., reducing book-closing time by 72% [3]), cut manual accounting costs by over 60% [4], and enhance compliance by minimizing human error [5]. Case studies further suggest that system preferences and costs vary across retail formats [6, 7].

However, a significant gap exists between this potential and practical guidance. Existing literature often treats “small retail” as homogeneous, lacking a comparative, subsector-specific analysis of cost-benefit dynamics [8]. Cost-benefit linkages remain generic [9], and there is no integrated framework offering “contingent customization” strategies based on distinct operational profiles [10]. This limits actionable insights for business owners.

To address this, our systematic review synthesizes evidence from 34 studies [2, 11] analyzing cost-benefit dynamics across three key subsectors: convenience stores, hardware stores, and new retail formats. We confirm substantial yet heterogeneous benefits, identify digital readiness as a key moderator [12, 13], and demonstrate the inefficacy of a “one-size-fits-all” approach. Our core contribution is a differentiated “contingent customization” framework, providing evidence-based, actionable guidance to help small retailers align digital investments with their specific operational needs and strategic goals, thereby bridging the information gap and supporting informed digital transformation [14].

2. Theoretical Background

2.1 Technology-Organization-Environment (TOE) Framework

The TOE framework posits that technology adoption is influenced by three contextual dimensions: technological (e.g., perceived ease of use, security), organizational (e.g., firm size, management support, digital readiness), and environmental (e.g., competitive pressure, vendor support, regulation) [15, 16]. In this review, TOE serves two functions: it structures the identification of adoption factors across subsectors (Section 5.1), and it provides theoretical grounding for subsector heterogeneity—operational characteristics, shaped by these contextual conditions, directly influence which DAS configurations are feasible and value-maximizing.

2.2 Resource-Based View and Digital Readiness

The Resource-Based View (RBV) explains differential firm performance through heterogeneity in internal resources that are valuable, rare, inimitable, and non-substitutable. This review conceptualizes Digital Readiness—encompassing employee digital skills, managerial digital acumen, and absorptive capacity—as precisely such a capability [17]. The RBV lens explains why benefit realization is not automatic: firms with higher digital readiness are better positioned to convert DAS investments into performance gains, while firms lacking this capability realize substantially lower returns even when deploying identical systems.

2.3 Cost-Benefit Analysis as an Evaluative Framework

Cost-Benefit Analysis (CBA) provides a systematic approach for evaluating investments by identifying, quantifying, and comparing relevant costs and benefits over time [9]. In this review, CBA principles are applied in two ways. First, it deconstructs the full cost structure of DAS adoption beyond visible subscription fees to include hidden costs such as training, data migration, and productivity loss (Table 1). Second, it synthesizes empirical evidence to quantify multi-dimensional benefits across financial, operational, and compliance domains (Section 4.1). By mapping costs and benefits against subsector-specific operational profiles, CBA underpins the evaluative logic of the proposed “contingent customization” framework.

2.4 Synthesis

Collectively, these frameworks operate synergistically: TOE explains contextual drivers of adoption heterogeneity; RBV illuminates why identical systems yield divergent outcomes; and CBA provides the evaluative logic for calibrating optimal system configurations. Together, they form the theoretical infrastructure upon which this review's analysis and recommendations are constructed.

3. Methodology

To ensure comprehensiveness and rigor, this review was conducted following established systematic review principles. A structured Boolean search was performed across four major academic databases: Web of Science, Scopus, ScienceDirect, and China National Knowledge Infrastructure (CNKI). The search aimed to capture literature published between January 2018 and March 2026, utilizing keywords that combined core concepts ("digital accounting," "cloud accounting," "small retail," "SME," "cost-benefit analysis") with specific retail format terms ("convenience store," "hardware store," "unmanned retail") in both English and Chinese [2, 11].

The screening process involved two stages: an initial title/abstract screening, followed by a full-text assessment against explicit eligibility criteria. To be included, studies must primarily focus on small or micro retail enterprises [1, 18], with DAS adoption or evaluation as a central theme, and present empirical analysis of costs, benefits, or both. Peer-reviewed journal articles, theses, and detailed industry case studies were included, while books, editorials, and non-empirical reports were excluded.

The final corpus comprises 34 articles that satisfied all criteria, including 12 in-depth case studies. These studies were thematically coded into three pre-defined analytical categories—(1) Cost Composition, (2) Benefit Dimensions, and (3) Strategic Influencing Factors—to facilitate a subsequent comparative cross-analysis across retail subsectors.

4. Analysis From Three Dimensions

4.1 The Anatomy of Costs: A Multidimensional and Subsector-Specific Structure

The cost of implementing a DAS in a small retail setting extends far beyond simple software subscription fees. It constitutes a composite structure encompassing both explicit and hidden costs, which is intrinsically linked to the specificities of the retail subsector.

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Operational complexity directly shapes the differentiated full-cycle cost structure of DAS adoption across subsectors, with specific characteristics as follows:

Convenience stores, featuring standardized SKUs and high transaction frequency, typically adopt lightweight SaaS cloud accounting, with low one-time costs (annual subscription ¥4,800-6,000 [5,7]), core recurring costs of subscription fees, and key hidden risks in staff training (costs reducible by 75% via vendor tutorials [5]) and data migration.

Hardware stores, with complex SKUs (10,000+) and rigid inventory-accounting integration demand, mostly use inventory-finance integrated ERP modules, requiring significant one-time hardware retrofit investment (~¥12,000 [9]), recurring costs for functional module subscriptions (annual savings of ~¥6,000 by avoiding full-suite packages [10, 18]), and hidden risks in customization complexity and productivity loss during business process re-engineering.

New retail formats (unmanned kiosks, community group retail) with fully automated, high-concurrency transactions adopt customized auto-bookkeeping systems, with one-time scenario-specific deployment costs (e.g., \$2,000 per kiosk [19, 20]), recurring cloud storage and maintenance fees (¥1,000-8,000/year [19]), and core risks of cloud vendor dependency and peak-load system instability.

For retailers covered by policy support (e.g., county-level “shared ERP” public platforms), the cost structure shows inclusive features: near-zero initial investment [21], pay-per-use recurring fees, and primary risks in data sovereignty and security [21].

The analysis confirms that DAS cost structures evolve from lightweight subscription models to hardware retrofit plus modular customization along with rising operational complexity. Hidden costs and managerial risks, including insufficient staff digital skills [22] and over-reliance on external vendors [19], are common cross-sector challenges frequently underestimated in adoption decisions.

4.2 Dimensions of Benefit Realization: Quantitative Evidence and Moderating Factors

4.2.1 Quantifiable Core Benefits

Financial benefits are most evident in labor savings and ROI. Case studies show labor cost reductions of 30%-80% [5] and a 22% decrease in overstock costs for hardware stores [9]. New retail formats can achieve payback periods as short as 6 months [23], with median ROI within 12 months for SME automation [24].

Operational benefits include major efficiency gains: monthly book closing can be reduced from a week to under 8 hours, and procurement reconciliation from 8 hours weekly to just 1 hour [6, 9]. Intelligent features (e.g., FIFO systems) can cut manual errors by up to 40% [5, 25].

Compliance benefits are achieved by embedding regulatory rules, nearly eliminating human error. Studies indicate a 92% reduction in tax misreporting risks and the potential to eliminate compliance fines [5, 22].

4.2.2 The Critical Moderator: Digital Readiness

Benefit realization is not automatic. Digital Readiness—encompassing employee skills, managerial digital acumen, and absorptive capacity—is a crucial moderating variable [17]. Organizations with higher digital readiness are better positioned to unlock the full potential of their DAS investments. Successful adoption and value maximization require a holistic consideration of technological, organizational, and environmental factors, leading to subsector-adapted strategic choices.

4.3 Strategic Influencing Factors

4.3.1 Key Factors Influencing Adoption

Guided by the Technology-Organization-Environment (TOE) framework, critical factors include: Technological factors like perceived ease of use and security concerns [15]; Organizational factors, most notably top management support [26]; and Environmental factors such as competitive pressure and external support from governments or vendors [15, 27]. Among these, concerns over cost and data security remain primary adoption barriers [28].

4.3.2 A Framework for Subsector-Adapted Optimization Strategy

The core principle is “Contingent Customization”—strategic choices must be precisely aligned with subsector characteristics. Convenience stores should prioritize SaaS systems with “multi-store data consolidation” capabilities to meet the standardization and cost-control needs of chain or franchise models [7]. Hardware stores must focus on core “inventory-finance deep integration” modules, deliberately avoiding costly, redundant full-suite packages to address inventory-centric pain points. New retail formats need to emphasize functionalities like “real-time automated bookkeeping for high-frequency transactions” and “dynamic inventory alerts” to suit their unmanned, high-volume operational scenarios [29, 23]. Furthermore, adopting an IT governance perspective—such as managing vendor risk through clear Service Level Agreements (SLAs) and conducting regular system audits—is fundamental for ensuring the long-term stability and performance of any chosen system [17].

5. Discussion

5.1 Interpretation of Findings and Theoretical Implications

The identified cost structures—ranging from lightweight SaaS subscriptions in convenience stores to integrated ERP modules in hardware stores and scenario-specific systems in new retail—align with and extend the Technology-Organization-Environment (TOE) framework. The variation in cost composition is not merely a function of technological choice but is deeply intertwined with operational complexity, scale, and transaction patterns characteristic of each subsector. This supports the notion that technological adoption in SMEs is a configurational rather than a universal process, wherein the fit between technology and organizational context determines economic outcomes. Furthermore, the moderating role of digital readiness—encompassing skills, managerial acumen, and absorptive capacity—provides a nuanced explanation for why similar systems yield divergent benefits across organizations. This finding resonates with the resource-based view of the firm, suggesting that intangible organizational capabilities are critical complements to tangible IT investments.

5.2 Practical Implications for Stakeholders

For small retail owners and managers, this review offers an actionable, evidence-based roadmap for DAS adoption. The proposed “contingent customization” strategy advocates for aligning system capabilities with subsector-specific operational profiles. Convenience stores should prioritize multi-store data consolidation to support standardization and cost control in chain or franchise models. Hardware stores must seek deep inventory-finance integration while avoiding costly full-suite packages that exceed functional necessities. New retail formats require automated, real-time bookkeeping functionalities to handle high-frequency, unmanned transactions. Beyond functional alignment, the review underscores the importance of hidden cost management—such as training, data migration, and vendor dependency—which is often underestimated during adoption decisions. Adopting an IT governance perspective, including clear Service Level Agreements (SLAs) and regular system audits, is essential for sustaining long-term value.

5.3 Limitations and Future Direction

Despite providing a structured synthesis of available evidence, this review acknowledges several limitations. First, the included studies are predominantly case-based or cross-sectional, limiting insights into the longitudinal evolution of costs and benefits. Second, the geographic focus of extant literature is uneven, with a predominance of studies from East Asia and Europe, which may affect the generalizability of findings to other regional contexts such as Africa or Latin America. Third, the rapid pace of technological change—particularly the emergence of lightweight AI and RPA tools—means that some of the reviewed systems may already be evolving, necessitating continual updates to cost-benefit models. Future research should prioritize longitudinal and comparative studies across subsectors and regions, particularly in emerging markets. It should also explore AI and RPA integration in micro-retail [30], and develop decision-support tools that translate academic insights into practical guidance for business owners. These efforts will further illuminate how small retail enterprises can navigate digital accounting adoption.

6. Conclusion

This systematic review was motivated by the persistent information asymmetry that small retail enterprises encounter when considering Digital Accounting Systems (DAS). By synthesizing and analyzing evidence from 34 studies, it provides a definitive response: the cost-benefit profile of DAS is not uniform but is fundamentally shaped by subsector-specific operational characteristics. The review deconstructs this heterogeneity, demonstrating how cost structures evolve from lightweight subscriptions in convenience stores to integrated solutions in hardware stores and bespoke deployments in new retail. Correspondingly, the pathway to value maximization lies in “contingent customization”—convenience stores require multi-store consolidation, hardware stores need deep inventory-finance integration, and new retail thrives on automated, high-frequency transaction processing.

The analysis further identifies digital readiness as a critical lever that moderates the translation of technological investment into tangible financial, operational, and compliance benefits. This insight moves the discourse beyond a purely technical evaluation to a strategic one, emphasizing the synergy between system capabilities and organizational preparedness.

The main contribution of this review is the creation of a differentiated, subsector-oriented analytical framework that directly fills a gap in the literature: the absence of detailed, comparative guidance for different types of retail formats. By moving beyond generic models, this framework equips small retail decision-makers with actionable, evidence-based criteria for aligning digital investments with their precise operational profiles and strategic goals.

While the findings are robust within the scope of the reviewed literature, their long-term dynamics and generalizability across all geographic contexts warrant further investigation. Future research, particularly longitudinal studies and explorations into emerging technologies like AI and RPA for micro-retail, will build upon this foundation. Ultimately, this review underscores that successful digital transformation in small retail is an exercise in strategic precision, and it aims to serve as a foundational guide for both scholarly inquiry and practical implementation in this vital sector.

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