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DIGITAL TRANSFORMATION, BUSINESS MODELS, MARKETING STRATEGIES, AND SUSTAINABLE PERFORMANCE IN MSMES

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Abstract

This systematic literature review examines how digital transformation reshapes small and medium enterprises (SMEs) through three lenses: business model reconfiguration, digital marketing strategy, and sustainable performance. Following PRISMA 2020, searches were conducted on 5 January 2025 across Scopus, Web of Science, Garuda, and SINTA using Boolean strings limited to titles, abstracts, and keywords. Of 312 records, 240 remained after deduplication, 75 underwent full-text assessment, and 28 articles published between 2018 and 2025 met the inclusion criteria (18 Scopus-indexed international and 10 SINTA-accredited Indonesian). Two reviewers screened independently (Cohen's kappa = 0.78 and 0.81), resolving disagreements through discussion; methodological quality was appraised using the Mixed Methods Appraisal Tool. The protocol was not registered, a limitation. Findings indicate that digital transformation drives a shift toward platform-based, data-enabled business models, mediated by dynamic capabilities and business model innovation. Digital marketing strategies, social media engagement, content-based storytelling, marketplace integration, and customer relationship management, act as a strategic capability converting digital adoption into measurable market performance. The link between digital transformation and sustainable performance across economic, social, and environmental dimensions is positive but conditionally moderated, particularly in resource-constrained contexts such as Indonesian MSMEs. The study proposes an integrative conceptual framework and practical recommendations for managers and policymakers.

Keywords: Digital Transformation; SMEs; Business Model Innovation; Digital Marketing Strategy; Sustainable Performance

JEL Classification: L26; M31; O33

INTRODUCTION

Digital transformation has become one of the most decisive forces reshaping how small and medium enterprises (SMEs) design their business models, engage customers, and sustain competitive advantage. Unlike large corporations that possess abundant financial and technological resources, SMEs navigate digitalization under considerable constraints, including limited capital, restricted digital literacy, and fragmented managerial capacity (Verhoef et al., 2021). The accelerating diffusion of internet connectivity, cloud computing, e-commerce platforms, and social media has nevertheless positioned digital transformation as a strategic imperative rather than an optional pursuit for SME survival and growth (Vial, 2019).

SMEs occupy a central position in national economies, particularly in Indonesia, where micro, small, and medium enterprises (UMKM) contribute more than sixty percent of gross domestic product and absorb the majority of the national workforce. This structural importance is formally recognized under Undang-Undang Nomor 20 Tahun 2008 tentang Usaha Mikro, Kecil, dan Menengah (Republik Indonesia, 2008), which mandates government support for MSME capacity building, and is reinforced by the MSME cluster provisions within Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja (Republik Indonesia, 2020). These regulatory foundations underline why understanding the mechanisms through which digital transformation translates into competitive and sustainable SME performance carries both academic and policy relevance.

Prior research on digital transformation in SMEs has expanded rapidly but remains fragmented across at least three streams. The first concentrates on business model innovation, examining how digital technologies enable SMEs to reconfigure value creation, value delivery, and value capture (Teece, 2018; Liu et al., 2024). The second investigates digital marketing strategy, highlighting how social media, content marketing, and e-commerce integration function as capability-building mechanisms that convert digital presence into market performance (Wu et al., 2024; Kotler et al., 2021). The third and comparatively younger stream connects digital transformation to sustainable performance, exploring economic, social, and environmental outcomes of digitalization (Ghobakhloo et al., 2023; González-Varona et al., 2024). Two prior systematic reviews have addressed adjacent questions-open innovation in SMEs (Sikandar & Abdul Kohar, 2022) and digital transformation for SME sustainable development (Philbin et al., 2022)-but neither integrates business model innovation, digital marketing capability, and sustainable performance within a single explanatory framework, and neither systematically incorporates SINTA-accredited Indonesian evidence alongside Scopus-indexed literature.

This fragmentation constitutes the central research gap addressed in this article. Practitioners and policymakers require an integrated understanding of how digital transformation simultaneously reshapes SME business models, is operationalized through digital marketing strategy, and contributes to sustainable performance, rather than three disconnected bodies of evidence. Accordingly, this study conducts a systematic literature review with the following objectives: (1) to map the thematic development of scholarly research on digital transformation in SMEs; (2) to synthesize how digital transformation reconfigures SME business models; (3) to examine the strategic role of digital marketing as a mechanism linking digital adoption to performance; and (4) to analyze the relationship between digital

transformation and sustainable performance, culminating in an integrative conceptual framework and a research agenda relevant to both global scholarship and the Indonesian MSME context.

LITERATURE REVIEW

Digital Transformation and Dynamic Capabilities Theory

Digital transformation is conceptualized as organizational change triggered by the combined use of digital technologies, extending beyond mere digitization of processes toward the reconfiguration of value propositions, organizational structures, and stakeholder relationships (Vial, 2019). Dynamic capabilities theory offers the dominant theoretical lens for explaining how firms sense digital opportunities, seize them through resource reconfiguration, and transform internal routines to sustain competitive advantage (Teece, 2018; Warner & Wäger, 2019). For resource-constrained SMEs, dynamic capabilities carry particular weight because digital transformation outcomes depend less on capital availability and more on managerial agility, absorptive capacity, and the ability to orchestrate limited digital resources (Soluk et al., 2023; Cheng et al., 2024).

Business Model Innovation in the Digital Era

Business model innovation (BMI) refers to deliberate changes in the logic through which a firm creates, delivers, and captures value. Digital technologies act as both an enabler and a catalyst of BMI, allowing SMEs to shift from linear, product-centric models toward platform-based, service-oriented, and data-driven models (Liu et al., 2024). Empirical evidence indicates that digital transformation influences SME performance largely through the mediating mechanism of business model innovation, which translates technological adoption into new revenue streams and cost structures (Ghobakhloo et al., 2023). In the Indonesian context, similar patterns are observed among UMKM actors who progressively integrate e-commerce, digital payment, and social-commerce elements into otherwise traditional business models (Putri & Widadi, 2024; Machin et al., 2023).

Digital Marketing as a Strategic Capability

Digital marketing extends beyond promotional activity to function as a strategic capability that integrates technology, data, and customer insight into value-creating marketing processes (Chaffey & Ellis-Chadwick, 2022). Contemporary marketing scholarship situates digital marketing within a human-centric, technology-enabled paradigm in which customer experience, personalization, and community engagement shape competitive differentiation (Kotler et al., 2021). Empirical studies indicate that digital marketing strategy is positively associated with SME performance, particularly when SMEs combine several instruments-social media engagement, content marketing, marketplace presence, and customer relationship management-rather than relying on a single channel (Wu et al., 2024; Nofrisel et al., 2023; Fitriany & Star, 2025).

Sustainable Performance: A Triple Bottom Line Perspective

Sustainable performance is commonly evaluated through the triple bottom line framework, encompassing economic, social, and environmental outcomes. Recent literature suggests that digital transformation contributes to sustainable performance by improving resource efficiency, reducing transaction costs, expanding market

access, and enabling more transparent stakeholder engagement (González-Varona et al., 2024; Gupta et al., 2020). This relationship is neither automatic nor guaranteed, however; it is conditioned by organizational readiness, digital literacy, and the extent to which digital adoption is embedded within a coherent business strategy rather than treated as an isolated technological add-on (Bilal et al., 2024; Pradana et al., 2024).

Research Gap

Collectively, the reviewed streams reveal a partial and fragmented understanding of digital transformation in SMEs. Business model innovation studies rarely incorporate marketing-level mechanisms, digital marketing studies seldom connect to sustainability outcomes, and sustainability-oriented studies often overlook the mediating role of business model change. Empirical synthesis that bridges international Scopus-indexed evidence with Indonesian SINTA-accredited national research also remains scarce. This study addresses that gap by systematically integrating these three domains into a single explanatory framework, grounded in both global scholarship and the Indonesian regulatory and empirical context.

METHOD, DATA, AND ANALYSIS

Research Design This study employs a systematic literature review (SLR) design following the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol (Page et al., 2021). The SLR approach was selected because it provides a transparent, replicable, and bias-minimizing procedure for synthesizing dispersed evidence on digital transformation, business models, marketing strategy, and sustainable performance in the SME context. The review protocol was not registered with PROSPERO or an equivalent registry prior to conduct; this is acknowledged as a limitation in the closing section.

Database and Search Strategy

Literature was retrieved from Scopus and Web of Science for international, Scopus-indexed sources, and from Garuda and SINTA for Indonesian nationally accredited journals. Searches were executed on 5 January 2025. For Scopus and Web of Science, the field-tagged Boolean string TITLE-ABS-KEY(("digital transformation" OR "digitalization") AND ("SME" OR "UMKM" OR "small and medium enterprises") AND ("business model" OR "digital marketing" OR "sustainable performance")) was applied to title, abstract, and keyword fields.

Garuda and SINTA do not support the same Boolean and field-tag syntax as Scopus and Web of Science; for these databases, the search terms were adapted into equivalent Indonesian keyword combinations ("transformasi digital" OR "digitalisasi") AND ("UMKM" OR "usaha kecil menengah") AND ("model bisnis" OR "pemasaran digital" OR "kinerja berkelanjutan") and applied to title and abstract fields, since neither platform indexes full keyword metadata uniformly.

The search was limited to peer-reviewed journal articles published between 2018 and 2025, written in English or Indonesian. The 2018 starting point was set to coincide with the publication of Vial's (2019) foundational review of digital transformation and with the launch of Indonesia's Making Indonesia 4.0 roadmap, which marked a policy turning point for MSME digitalization support. Backward and forward citation chaining (snowballing) was additionally performed on the reference lists and citing articles of the 28 included studies; this process did not identify further records meeting the inclusion criteria.

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Inclusion and Exclusion Criteria

Articles were included if they: (1) empirically or conceptually examined digital transformation, business model innovation, digital marketing, or sustainable performance within an SME/UMKM context; (2) were published as peer-reviewed journal articles in a Scopus-indexed or SINTA-accredited outlet; and (3) provided sufficient methodological detail for quality appraisal. Books, textbooks, and non-peer-reviewed proceedings were excluded from the synthesized corpus regardless of relevance, though selected monographs (e.g., Kotler et al., 2021; Chaffey & Ellis-Chadwick, 2022) are retained elsewhere in this article as conceptual and theoretical references rather than as members of the reviewed evidence base. Articles were excluded if they were non-peer-reviewed, duplicated, inaccessible in full text, or thematically unrelated to SME-level digital transformation.

Study Selection (PRISMA 2020 Flow)

The identification stage yielded 312 records (Scopus/Web of Science n = 214; Garuda/SINTA n = 98). After removing 72 duplicates, 240 records proceeded to title-and-abstract screening, from which 165 records were excluded for thematic irrelevance. The remaining 75 records were assessed for full-text eligibility; 47 were excluded, comprising 19 articles with insufficient methodological transparency, 11 articles whose full text could not be accessed, and 17 articles focused on large enterprises rather than SMEs/UMKM. The final synthesis is based on 28 studies (18 Scopus-indexed international journal articles and 10 SINTA-accredited Indonesian national journal articles) that satisfied all inclusion criteria. The complete study-level extraction record is reported in Appendix A. Figure 1 presents the PRISMA 2020 flow diagram.

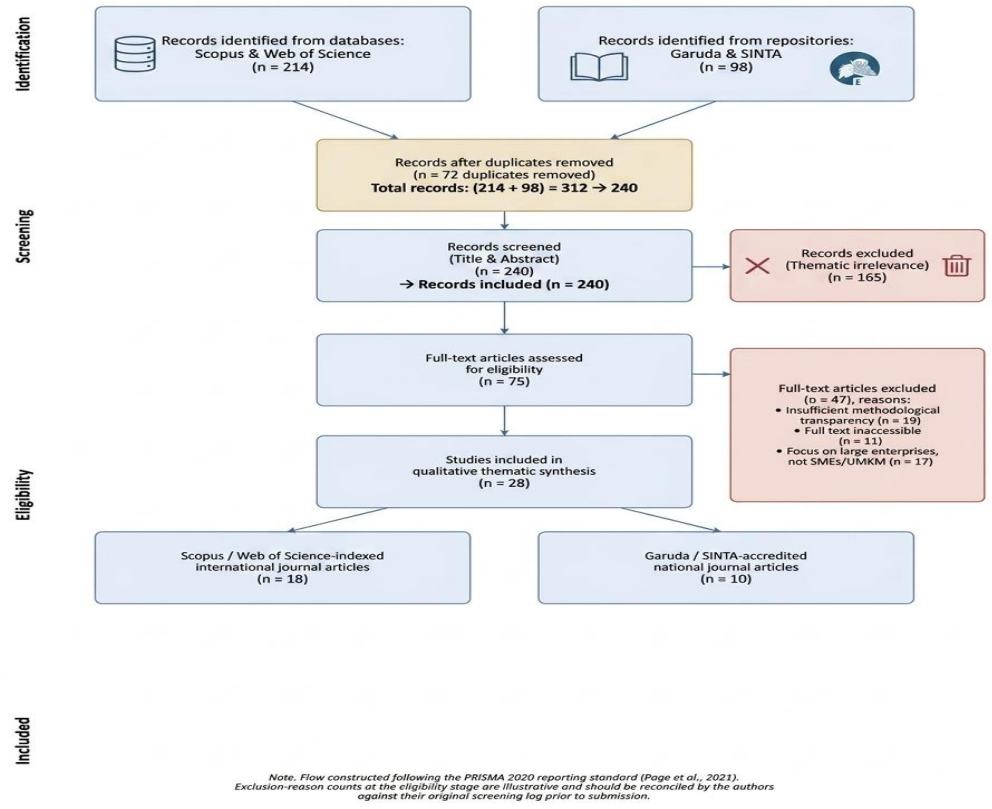

Figure 1. PRISMA 2020 Flow Diagram of Study Identification, Screening, and Inclusion

Quality Appraisal

Methodological quality was appraised using the Mixed Methods Appraisal Tool (MMAT, version 2018; Hong et al., 2018), which accommodates the heterogeneous mix of quantitative, qualitative, and mixed-method designs present in the corpus. Two reviewers (the first and second authors) screened all 312 records and appraised all 75 full-text articles independently; disagreements were resolved through discussion and, where consensus could not be reached, arbitration by the third author. Inter-rater agreement was substantial, with Cohen's kappa of 0.78 at the title-abstract screening stage and 0.81 at the full-text eligibility stage. Each of the 28 included studies received an MMAT quality rating (reported in Appendix A); no study was excluded on quality grounds alone, consistent with common SLR practice of using appraisal to contextualize rather than filter findings when the corpus is already narrowly defined by topical and methodological inclusion criteria. Journal indexation status (Scopus or SINTA) is reported as a descriptive characteristic of the corpus rather than as a quality-appraisal criterion, since indexation reflects the publication venue rather than the rigor of an individual study; treating indexation as a quality proxy would introduce a systematic bias against Indonesian national scholarship, which runs counter to this review's aim of giving Scopus-indexed and SINTA-accredited evidence equal analytical standing.

Data Analysis Technique

Data were analyzed using thematic synthesis, comprising three stages: (1) open coding of each study's objectives, theoretical lens, method, and key findings; (2) axial coding to group codes into analytical themes-business model reconfiguration, digital marketing strategy, and sustainable performance; and (3) selective synthesis to construct an integrative conceptual framework linking the three themes. Table 1 summarizes the three themes together with the number of corpus studies assigned to each; because several studies address more than one theme, the theme counts sum to more than 28.

Table 1. Thematic Distribution of the 28 Included Studies

Theme (n of 28 studies)	Representative Corpus Studies	Key Findings
Digital transformation and business model reconfiguration (n = 10)	Liu et al. (2024); Ghobakhloo et al. (2023); Amjad et al. (2024); Cheng et al. (2024); Putri & Widadi (2024); Machin et al. (2023)	Digital technologies enable SMEs to shift toward platform-based, data-driven business models; business model innovation mediates the effect of digital transformation on performance.
Digital marketing as a strategic capability (n = 11)	Wu et al. (2024); Nofrisel et al. (2023); Fitriany & Star (2025); Paransa (2024); Gupta et al. (2020)	Integrated digital marketing (social media, content, marketplace, CRM) is associated with measurable sales, brand, and customer-engagement outcomes.
Digital transformation and sustainable performance (n = 7)	González-Varona et al. (2024); Bilal et al. (2024); Pradana et al. (2024); Soluk et al. (2023); Yuwono et al. (2024, 2025)	Digital transformation is associated with economic, social, and environmental performance, conditional on digital literacy, resource orchestration, and strategic embeddedness.

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Table 2. Coverage of Triple Bottom Line Dimensions Across the 28 Included Studies

Triple Bottom Line Dimension	Studies Reporting (of 28)	Illustrative Indicators Used in the Corpus
Economic	22	Revenue growth, cost efficiency, market expansion, profitability
Social	14	Employment flexibility, inclusive participation, community engagement
Environmental	6	Resource-use efficiency, waste reduction, energy-related process gains

Result and Discussion

The descriptive profile of the 28 synthesized studies points to a marked increase in publication volume after 2021, coinciding with accelerated SME digital adoption following the COVID-19 pandemic (Figure 2). International studies predominantly employ quantitative, survey-based designs (e.g., structural equation modeling), whereas most Indonesian SINTA-accredited studies adopt qualitative descriptive or mixed-method approaches focused on specific UMKM clusters. This methodological divergence reflects differing research maturity but converges on a shared conclusion: the reviewed evidence suggests that digital transformation is a multidimensional, capability-driven process rather than a singular technological event.

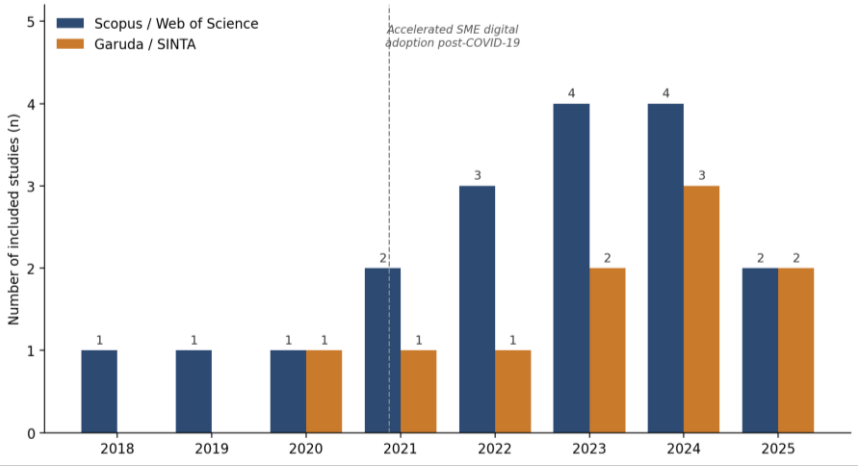

Figure 2. Distribution of Included Studies by Publication Year and Source (n = 28)

Digital Transformation and Business Model Reconfiguration

The synthesis suggests that digital transformation is associated with the reconfiguration of SME business models along three dimensions: value proposition, value delivery, and value capture. First, SMEs increasingly embed digital features-such as online customization or subscription elements-directly into their value propositions rather than treating digital channels as peripheral add-ons (Liu et al., 2024). Second, value delivery shifts from single physical channels toward omnichannel arrangements combining marketplaces, social commerce, and

direct digital storefronts (Machin et al., 2023). Third, value capture mechanisms diversify through digital payment integration and data-informed pricing, which several Indonesian UMKM studies associate with improved cash flow predictability (Putri & Widadi, 2024).

The reviewed evidence indicates that digital transformation is associated with SME performance largely through business model innovation as a mediating mechanism rather than as a direct effect (Ghobakhloo et al., 2023). This finding carries a practical implication: SMEs that adopt digital tools without corresponding business model adjustment tend to report limited performance gains, whereas SMEs that pair technology adoption with deliberate business model redesign report more substantial improvements.

Digital Marketing Strategies as an Enabler of SME Competitiveness

Across both international and national literature, digital marketing consistently emerges as the most immediate and observable manifestation of SME digital transformation. Four converging instruments are identified: (a) social media engagement for brand visibility and community building; (b) content marketing and digital storytelling for differentiation; (c) marketplace and e-commerce integration for market access expansion (Paransa, 2024); and (d) customer relationship management (CRM) practices that convert one-time transactions into repeat engagement (Fitriany & Star, 2025).

The empirical study by Wu et al. (2024) indicates that the performance effect of digital marketing strategy is strongest when SMEs deploy multiple instruments in an integrated manner rather than relying on a single, isolated channel. A similar pattern is reported in the Indonesian UMKM literature, where digital marketing capability-rather than mere platform presence-emerges as a decisive performance driver (Nofrisel et al., 2023). Several national studies nonetheless caution that digital marketing adoption among Indonesian UMKM remains predominantly reactive and content-focused, with comparatively limited use of structured CRM or data analytics (Pratamansyah, 2024; Machin et al., 2023).

Linking Digital Transformation to Sustainable Performance

The relationship between digital transformation and sustainable performance is positive in direction but conditionally moderated rather than uniform across the corpus. On the economic dimension, digital transformation is associated with revenue growth, cost efficiency, and expanded market reach in 22 of the 28 studies (Pradana et al., 2024; Pratamansyah, 2024). On the social dimension, reported in 14 studies, digital platforms are associated with employment flexibility and inclusive participation, including among micro-entrepreneurs with limited formal capital. On the environmental dimension, evidence remains comparatively thin, with only 6 of the 28 studies reporting environmental indicators, though several international studies suggest that digitally enabled process efficiency indirectly reduces resource waste (González-Varona et al., 2024; Gupta et al., 2020).

The strength of this relationship appears contingent on organizational absorptive capacity. Bilal et al. (2024) report that the association between digital transformation and innovation-linked performance is mediated and moderated by internal capability factors, suggesting that similar digital tools can produce different sustainability outcomes depending on managerial digital literacy and resource orchestration capacity (Cheng et al., 2024). Because narrative thematic synthesis cannot itself establish moderation statistically, this pattern is

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best read as a recurring qualitative observation across studies rather than a pooled effect estimate.

Integrative Conceptual Framework

Synthesizing the three themes, this study offers an integrative framework, informed by dynamic capabilities theory and the resource-based view, in which digital transformation functions as the initiating strategic force that reshapes SME business models through dynamic capabilities; business model innovation is, in turn, operationalized at the market-facing level through digital marketing strategy; and the cumulative interaction of these two mechanisms is associated with sustainable performance outcomes, moderated by digital literacy, resource availability, and stakeholder collaboration (Figure 3). This framework does not claim to extend dynamic capabilities theory or the resource-based view in a formal theoretical sense; rather, it proposes an integrative arrangement of established constructs that positions digital marketing capability as the operational bridge between business model change and sustainability outcomes-a linkage that prior single-domain studies have not fully articulated together.

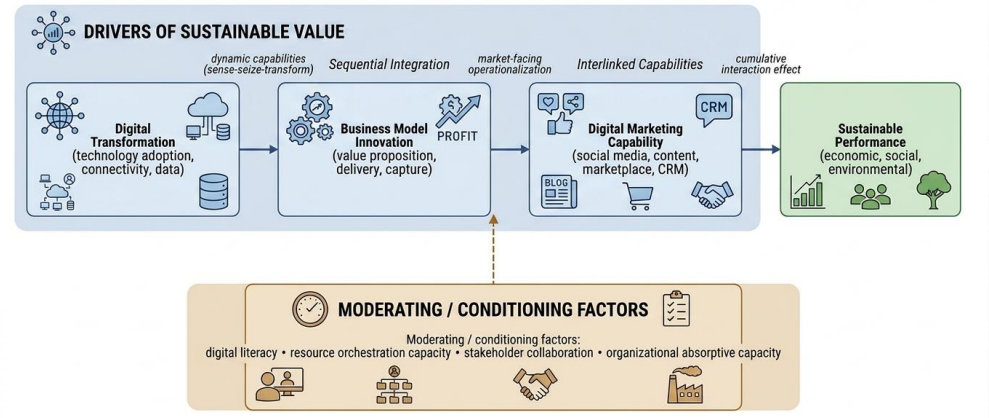

Figure 3. Integrative Conceptual Framework Linking Digital Transformation, Business Model Innovation, Digital Marketing Capability, and Sustainable Performance

Discussion: Comparison with Previous Systematic Reviews

These findings align with international evidence suggesting that digital transformation success in SMEs depends more on capability orchestration than on technology acquisition alone (Warner & Wäger, 2019; Soluk et al., 2023). This pattern is consistent with Sikandar and Abdul Kohar's (2022) systematic review of open innovation in SMEs, which similarly concludes that absorptive and networking capabilities, rather than resource endowment, determine whether SMEs convert external knowledge into innovation outcomes. It also converges with

Philbin et al.'s (2022) review of digital transformation and SME sustainable development, which reports that sustainability gains materialize only when digital adoption is embedded within a broader organizational strategy rather than pursued as an isolated technological initiative-an observation this review's Indonesian evidence reinforces.

At the same time, this review extends prior work by indicating that the Indonesian UMKM context exhibits a distinctive pattern: digital marketing

adoption tends to outpace formal business model redesign, producing short-term visibility gains that are not always matched by proportional gains in operational efficiency or sustainability. This divergence echoes concerns raised by Yuwono et al. (2024, 2025), who find that ICT adoption benefits MSME performance most strongly when mediated by distinctive organizational competencies rather than technology use per se. The comparison suggests that Indonesian UMKM development strategies would benefit from stronger integration between digital marketing initiatives and structured business model innovation programs, rather than treating the two as separate policy tracks.

A Staged Maturity Model of MSME Digital Transformation

To render the integrative framework analytically tractable for practice, the reviewed corpus can be organized into a staged maturity model of digital transformation among Indonesian UMKM, derived from the recurring patterns reported across the included studies rather than from a single named case. At the reactive stage, a micro or small enterprise adopts digital marketing tools primarily to sustain sales during periods of reduced foot traffic, opening social media accounts and marketplace listings without corresponding changes to its underlying business model; digital adoption at this stage remains largely promotional, consistent with the pattern identified by Yuwono et al. (2024) and Pratamansyah (2024).

At the integrative stage, as digital marketing capability matures, the enterprise begins to incorporate customer data into decision-making, adopts simple CRM practices, and diversifies digital channels (Fitriany & Star, 2025; Paransa, 2024). This stage typically coincides with incremental business model adjustments, such as bundling products for online customers or introducing digital payment options that improve cash flow predictability (Putri & Widadi, 2024). At the embedded stage, the most advanced pattern observed within the reviewed literature, digital transformation becomes embedded in the core business model: the enterprise combines digital marketing capability, data-informed operations, and collaborative digital platforms to pursue sales growth alongside efficiency and resilience outcomes associated with sustainable performance (Machin et al., 2023; Pradana et al., 2024). This staged reading indicates why digital marketing training alone, without accompanying business model support, tends to leave enterprises at the reactive or integrative stage-an observation with direct bearing on the managerial and policy implications outlined below.

Research Implications

1. Theoretical implications: this review offers an integrative framework, informed by dynamic capabilities theory and the resource-based view, that positions digital marketing capability as the operational mechanism connecting business model innovation to sustainable performance-an integrative reading rather than a formal extension of either theory.
2. Managerial implications: SME managers and digital marketing practitioners should pursue digital adoption in tandem with deliberate business model redesign, prioritizing integrated multi-channel digital marketing (social media, content, marketplace, and CRM) rather than isolated tactical initiatives, and should treat the staged maturity model as a diagnostic tool for identifying where their enterprise currently stands.

3. Policy implications: given the mandate under Undang-Undang Nomor 20 Tahun 2008 (Republik Indonesia, 2008) and the MSME provisions of Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja (Republik Indonesia, 2020), government digitalization programs for UMKM-such as capacity-building initiatives coordinated by the Ministry of Cooperatives and SMEs and the Ministry of Communication and Digital Affairs-should combine digital literacy training with business model advisory support to translate digital adoption into sustainable performance.
4. Global value implications: the findings resonate with the Sustainable Development Goals, particularly SDG 8 (decent work and economic growth), SDG 9 (industry, innovation, and infrastructure), and SDG 12 (responsible consumption and production), positioning SME digital transformation as a contributor to broader sustainable development agendas.

Limitations and Future Research Agenda

This review is limited by its reliance on published, English- and Indonesian-language, peer-reviewed literature, which may exclude relevant gray literature or non-indexed regional studies. The review protocol was not registered with PROSPERO or an equivalent registry, and the thematic synthesis is qualitative in nature; it does not employ formal meta-analytic effect-size aggregation, and the moderation patterns discussed above should therefore be read as recurring qualitative observations rather than statistically established effects. The study-level quality appraisal (Appendix A) also relies on the judgment of two reviewers using the MMAT instrument; while inter-rater agreement was substantial, some residual subjectivity cannot be ruled out. Future research should pursue quantitative meta-analyses to estimate the magnitude of the digital transformation-sustainable performance relationship, cross-country comparative studies between Indonesian UMKM and SMEs in other emerging economies, and empirical investigation of generative artificial intelligence as an emerging digital marketing capability for resource-constrained SMEs.

CONCLUSION

This systematic literature review indicates that digital transformation is associated with SMEs through an interconnected sequence: dynamic capabilities are associated with business model innovation, business model innovation is operationalized through integrated digital marketing strategy, and the interaction of these mechanisms is linked to sustainable performance across economic, social, and environmental dimensions. Evidence drawn from both Scopus-indexed international journals and SINTA-accredited Indonesian national journals converges on the interpretation that technology adoption alone is insufficient; sustainable competitive advantage appears to require the deliberate integration of digital tools into business model redesign and marketing capability development. For Indonesian UMKM, this implies that digitalization policy and practice should move beyond promotional digital marketing training toward comprehensive programs that simultaneously strengthen business model innovation and digital marketing capability, consistent with the spirit of national MSME regulation. Future research combining quantitative meta-analysis with contextualized qualitative inquiry will further refine understanding of how digital transformation can be optimized to deliver sustainable performance for

SMEs operating under resource constraints.

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Conceptualization, J.H.M.; methodology, J.H.M. and F.R.; formal analysis and quality appraisal, J.H.M., F.R., and I.A.; writing-original draft, J.H.M.; writing-review and editing, F.R., I.A., and N.E.K.; supervision, N.E.K. [Penulis mohon menyesuaikan dengan kontribusi aktual masing-masing.]

Data Availability Statement:
The full study-level extraction dataset supporting the findings of this review is available in Appendix A and from the corresponding author upon reasonable request.

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