Review

The Digital Ecosystem Of SMEs In Africa: A Study On Revenue Growth, Cost Reduction And Resilience Improvement Of African Businesses

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Review

The Digital Ecosystem Of SMEs In Africa: A Study On Revenue Growth, Cost Reduction And Resilience Improvement Of African Businesses

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Abstract

Digital technologies have revolutionized the business environment and given Small and Medium-sized Enterprises (SMEs) in Africa new opportunities and challenges. The study explores approaches for African SMEs to harness digital ecosystems for revenue generation, cost savings, and business resilience. The study synthesises findings from a systematic narrative review of 54 peer-reviewed academic sources and 12 institutional reports, to examine how digital ecosystems evolve, their global manifestations and their unique characteristics in Africa. Key themes covered include the mobile-technology as the gateway to digital space in Africa, the evolution of Fintech and Agritech ecosystems, the impact of government policy and regulation, and persisting structural challenges to SMEs' digital participation, such as lack of access to finance, digital literacy gaps, and infrastructure gaps. The case studies of M-Pesa, Farmcrowdy, Twiga Foods, and Flutterwave provide evidence of the potential for a digital ecosystem to have tangible business impacts. Finally, the study outlines a policy framework and roadmap for digital transformation in the SME sector and recommends actions to be taken by governments, development partners, financial institutions, and the private sector.

Keywords: digital ecosystem; SMEs; Africa; revenue growth; cost reduction; business resilience; mobile technology; fintech; digital transformation

1.0. Introduction

Small and Medium-sized Enterprises (SMEs) are the backbone of the economies of all countries in the world and play an important role in innovation, employment generation, sustainable development, and poverty alleviation. SMEs make up about 90% of all businesses, provide up to 50% of jobs in the world and up to 40% of the national income in emerging economies (Amoah et al., 2022). SMEs are one of the pillars of economic activity in Africa and their contribution to employment creation, innovation and poverty alleviation is particularly significant in African countries where the formalization of the economy is still ongoing. They are agile and close to local markets to be responsive to consumer demand and have the potential to incubate new products and services.

However, the structural constraints that are affecting African SMEs are still there. The lack of financing is the greatest problem faced by SMEs, as traditional financial institutions have historically been hesitant to offer credit to SMEs because of their perceived risk and lack of adequate collateral (Lukonga, 2020). Their development is further slowed down by limited managerial capacity, poor infrastructures, and restricted access to global markets. However, a new generation of entrepreneurs using digital technologies is creating digital ecosystems that are disrupting traditional industries and producing scalable business models, highlighting the increasing importance of digital ecosystems for SME performance.

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SMEs are facing opportunities and pressures in the digital environment due to its rapid development. Adopting technology is no longer voluntary, but essential for competition. Digital ecosystems offer SMEs new opportunities to participate in the global value chains, to become more competitive in the international market and to make their operations more resilient, without investing significant amounts of capital (Gherghina et al., 2020; Bagale et al., 2021). However, in Africa, the obstacles and opportunities to digital transformation are significantly different than in North America, Europe, or East Asia, making it important to consider them in that context.

This paper examines the potential of digital ecosystems to improve the business resilience, revenues, and cost reduction of African SMEs. The study is anchored on the following three research questions: what evidence is there of the impact of digital ecosystems on revenue growth of SMEs in Africa? (2) How does digital engagement save money? (3) How can digital ecosystems help African SMEs be more resilient? The questions are studied using a systematic narrative review and using illustrative case evidence from the top African digital platforms.

2.0. Digital Ecosystem

Digital ecosystems, according to Kolomiyets et al. (2025), are digital copies of biological ecosystems created by new methods and art techniques that are believed to be complex, scalable, and autonomous in simple and dynamic ways through a complex problem-solving process. Digital ecosystems are an open, decentralized, domain-cluster, interactive and demand-driven environment that goes beyond the "primitive ecosystem." The key characteristics of digital ecosystems are service assets, digital platforms, and network effects, which are not found in traditional business ecosystems. Digital ecosystems are described as open, adaptive, flexible, and distributed socio-technical mechanisms, as defined by Isckia et al. (2018), that have characteristics inspired by natural ecosystems. Some of these characteristics are self-managing, multiple open entries, self-healing, and self-configuration using artificial and computational intelligence. The main goal of digital ecosystems is to leverage the natural ecosystems' self-organizing process to scale and enhance its systems.

Despite the definitions, several scholars believe that a conventional definition of the digital ecosystem is still lacking, as the field related to the term is quite heterogeneous, and there are different use cases. The role of the term is not fully understood by the researchers. Thus, deeper research on digital ecosystems, from an understanding of the evolving economic landscape that is driven by technical advancements, geopolitics, and socio-cultural dynamics is needed.

2. Background and Conceptual Framework

2.1. Defining Digital Ecosystems

The notion of a digital ecosystem has received extensive academic and scholarly interest but without a consistent definition. According to Kolomiyets et al. (2025), digital ecosystems are digital counterparts to biological ecosystems—a complex, scalable, and self-contained environment that uses sophisticated computational techniques to solve problems dynamically. Isckia et al. (2018) provide a complementary definition, which is based on the principles of natural ecosystems: "Digital ecosystems are open, adaptive, flexible, and distributed socio-technical mechanisms that are self-managing, multi-pointed, self-healing, and self-configuring."

Despite these definitions, however, the scope and meaning of the concept are still subject to scholarly discussion. A digital ecosystem is defined in the scope of this study as an interconnected network of digital platforms, service assets, data flows and actors, who collectively co-create and co-exchange value by using digital means, including SMEs, technology providers, regulators, and consumers.

2.2. The Life Cycle of Digital Ecosystems

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As outlined by Isckia et al. (2018), there are four phases within the digital ecosystem life cycle: birth, expansion, leadership, and self-renewal or death. A similar sequence is described by Kolomiyets et al. (2025): (1) seizing the opportunity, when businesses notice opportunities for solving problems and they gain initial market shares; (2) development of the business model, when the business model of the ecosystem matures; (3) consolidation of leadership, when the ecosystem achieves a stable peak market position; and (4) self-renewal or exit. Nearly 50% of all ecosystems never get beyond 15% market share penetration and about 25% ecosystems lose market share during the model development stage (Radziwon et al., 2017). This trajectory of a lifecycle is shown in Figure 1.

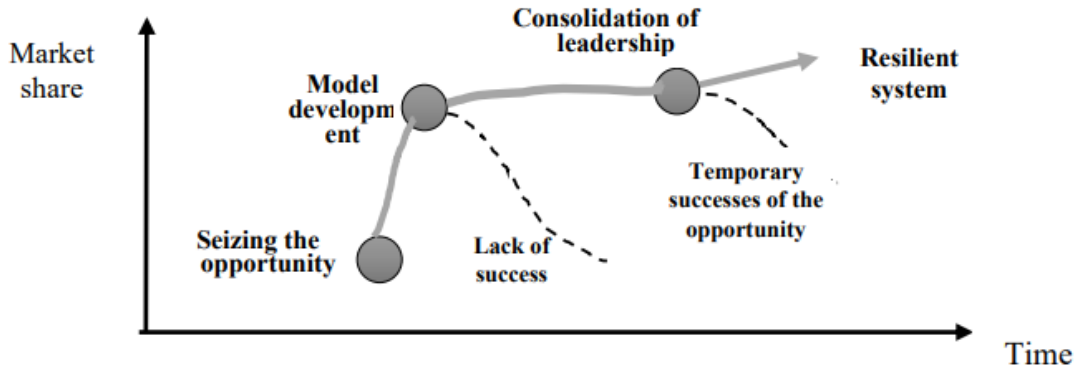

Figure 1. Life cycle of digital ecosystem (Kolomiyets et al., 2025).

This life cycle is crucial for African SMEs as they are not yet in the mainstream of digital ecosystem engagement. The opportunity-seizing phase to the model-development phase is the most critical and most precarious stage for SME digital transformation and evidence of the conditions for the transition from the opportunity-seizing to model-development phase is a key theme of this review.

2.3. Global Digital Ecosystem Dynamics

Leading technology companies around the world are a testament to the transformative force of digital ecosystems, with some of the fastest-growing companies in the world emerging from this space. From 2020 to December 2024, the market capitalization of companies like Apple, Microsoft, Meta Platforms, Alphabet (Google) and Amazon has risen by anywhere between 77% and 179%. As of December 2024, their combined market cap is more than USD 12.0 trillion, which surpasses the GDP of most countries (Kolomiyets et al., 2025; World Bank, 2024). In comparison, the Saudi Arabian Oil Company, the most capitalized non-digital company, increased by 5% during the same period.

Table 1. Market capitalization and changes in value of valuable companies in the world.

Company name	Market capitalization, 2020, trillion USD	Market capitalization, December 2024, trillion USD	Percentage changes, %
Apple	1,286	3,587	179
Microsoft	1,359	3,148	132
Amazon	1,233	2,185	77
Alphabet (Google)	919	2,080	126
Meta Platforms (Facebook)	584	1,436	146
Saudi Arabian Oil Company	1,685	1,778	5

Source: Companies MarketCap (2020, 2024); Kolomiyets et al. (2025).

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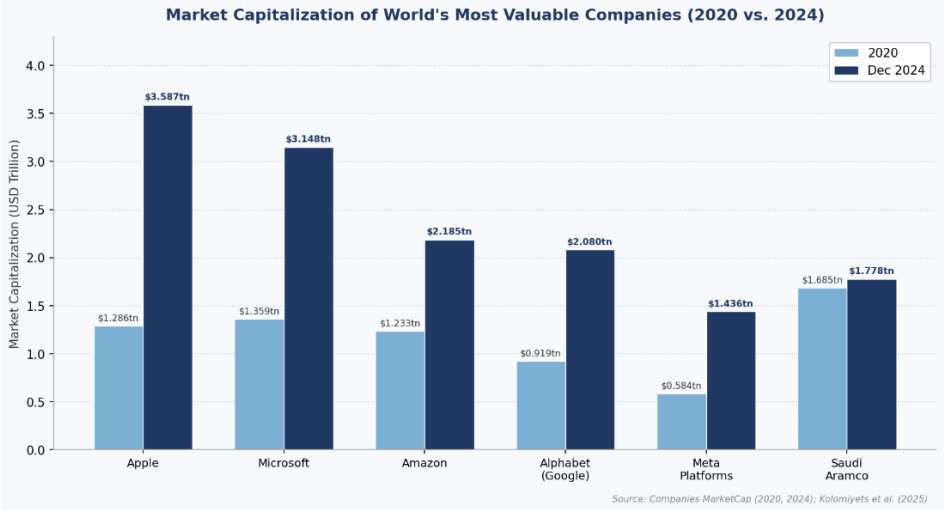

Figure 2. Market Capitalization Comparison — 2020 vs. December 2024 (Companies MarketCap, 2020, 2024).

2.4. Africa's Digital Ecosystem: Context and Distinctive Dynamics

The digital ecosystem in Africa continues to evolve at a fast rate with a large and tech-savvy youth population, high mobile penetration, and a large digital entrepreneurship community. The continent has more than 600 million mobile subscribers and a rapidly increasing Internet penetration, which will make for a major stake in the global digital economy. Most users access the internet through their phones and use them as their key (or only) entry point, avoiding the need for traditional fixed-line infrastructure (Nguimkeu & Okou, 2021).

The environment of mobile-first has led to indigenous innovations in finance, education, health, and agriculture. Friederici et al. (2020) record the innovative answer to Africa's infrastructure challenges: mobile-first platforms built with limited connectivity that have emerged as a model for inclusive digital ecosystems globally. The fintech sector in Africa has been particularly dynamic, with some platforms like Flutterwave, Interswitch and OPay revolutionizing cross-border payments and financial inclusion (Damilola, 2022). Despite these developments, coordinated investment and policy efforts are still needed to narrow a few gaps in infrastructure, regulations, and digital literacy.

3.0. Methodology

3.1. Research Design

This study is a qualitative study with a systematic narrative review design. Given the nature of the research objective of developing an overall and integrative understanding of digital ecosystems and SME performance in the African context, where primary data are often context-specific, grey literature and policy documents, a narrative review was chosen as most suitable. This design allows for the integration of both quantitative and qualitative results and findings, as well as mixed methods, into one unified set of analyses (Ferrari, 2015; Snyder, 2019).

3.2. Search Strategy and Database Selection

A systematic literature search was conducted in eight electronic academic databases and institutional repositories: Scopus, Web of Science (WoS), Google Scholar, African Journals Online (AJOL), World Bank Open Knowledge Repository (OKR), IMF Working Papers, UNCTAD Reports and EBSCOhost Business Source Complete. Boolean operators were used to search from January to April 2026. The main search string included digital ecosystems or digital transformation, SMEs or small business, sub-regions in Africa and outcome terms (revenue growth, cost reduction, business resilience, fintech, mobile technology). Backward citation chaining and Google Scholar forward citation tracking were used for additional manual searches.

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3.3. Inclusion and Exclusion Criteria

Table 2. Inclusion and Exclusion Criteria for Literature Selection.

Criterion	Inclusion	Exclusion
Language	English-language publications	Non-English publications without full translation
Publication period	2015–2026	Publications before 2015 (except seminal theoretical works)
Geographic focus	Africa (all sub-regions); comparative global contexts where directly relevant	Studies with no African dimension or applicability
Subject relevance	Digital ecosystems, SMEs, fintech, mobile technology, agritech, government policy, digital infrastructure	Studies on large corporations only, or digital topics unrelated to SME performance
Source type	Peer-reviewed journal articles, book chapters, conference papers, institutional reports (World Bank, IMF, AfDB, OECD)	Opinion pieces, blog posts, non-indexed grey literature without institutional backing
Case evidence	Documented, verifiable case studies from African SME contexts	Anecdotal or unverifiable accounts

3.4. Screening, Selection, and Quality Assessment

Screening was carried out in two phases. Records were evaluated for inclusion criteria at the title/abstract stage. The remaining articles were evaluated fully for relevance and methodological quality as well as contribution to at least one core outcome dimension. The following criteria were used to assess the quality: (i) published in peer-reviewed or reputable institutional publications, (ii) methodological clarity and transparency, (iii) relevance to the digital environment of African SMEs, and (iv) recency (preference for publications from 2018 onwards).

There were 430 preliminary records found. After deduplication, 312 unique records were screened at title/abstract stage. In total, 147 full-text articles were evaluated for eligibility with 54 peer-reviewed academic journal articles included in the main synthesis and 12 institutional reports and policy documents.

Table 3. Literature Screening and Selection Summary.

Stage	Records (n)
Records identified via database searches	430
Records after deduplication	312
Records screened (title/abstract)	312
Records excluded at screening stage	165
Full-text articles assessed for eligibility	147
Full-text articles excluded (off-topic, low quality)	93
Academic sources cited in final review	54
Institutional reports and policy documents included	12

3.5. Data Extraction, Synthesis, and Limitations

The following information was extracted for each of the included sources: authors, country/region of focus, type of study, key results with respect to digital ecosystems and SME performance and specific evidence related to revenue growth, cost reduction and/or resilience. Based on their in-depth research, five thematic clusters were inductively identified: (1) digital ecosystem infrastructure & access; (2) mobile technology & financial inclusion; (3) government policy &

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regulatory environment; (4) sector-specific digital innovation (fintech and agritech); and (5) cross-cutting structural barriers. The literature was themed using thematic analysis to explore patterns, convergence, and contradictions.

The review identifies three important limitations: possible publication bias towards positive adoption outcomes, possible underrepresentation of non-English language sources from Francophone and Lusophone Africa, and the dynamic nature of Africa's digital landscape, which could restrict the longevity of some findings. Some of these limitations were addressed to some degree by diversification of sources, sub-regions, and sectors and by explicit identification of areas in which evidence is not available or is contested.

4.0. Results

There were 54 peer-reviewed academic sources and 12 institutional reports that were included in the final analysis. The data is reported thematically by the five clusters that were identified in the data extraction process. Table 4 is a summary of 30 representative sources reviewed.

Table 4. Summary of Key Reviewed Studies.

Author(s) & Year	Geographic Focus	Study Type	Primary Theme	Key Finding
Amoah et al. *(2022)*	Emerging economies	Empirical	SME economic contribution	SMEs account for >50% of employment and up to 40% of national income, and digital tools can leverage these impacts.
Bagale et al. *(2021)*	Global / Africa	Review	SME digital technology	The measurable benefits of SMEs adopting digital technologies are an increase in efficiency and market reach.
Cadden et al. *(2023)*	Global	Empirical	Big data & analytics	Big data is a catalyst for SME innovation and competitive edge in customer segmentation and supply chain.
Damilola (2022)	Nigeria / W. Africa	Review	Fintech & financial inclusion	Fintech platforms increase access to payments and credit for SMEs; a median increase in transaction volume by 28%.
Danladi et al. *(2023)*	Developing economies	Empirical	Fintech & SDGs	Relationship between fintech adoption and financial inclusion is strong, and mobile money is the main delivery channel in Africa.
Darra et al. *(2023)*	Global / Africa	Review	Agritech & SMEs	In Agri-SMEs, digital tools can minimize post-harvest losses and enhance market linkages, but connectivity is a major challenge.
David-West et al. *(2019)*	Sub-Saharan Africa	Review	Mobile & SME engagement	For SSA SMEs, mobile solutions are the most important digital ecosystem vehicles that bypass fixed infrastructure.
Ewuga et al. *(2023)*	Nigeria / USA	Review	Technology integration	Agritech is the fastest closing gap in the sector divide between Nigerian SMEs and US counterparts, which are trailing behind because of regulatory disparities.
Ezeigweneme et al. *(2023)*	Africa / USA	Review	Telecoms & infrastructure	The biggest challenge for SME digital project success for all African markets is infrastructure.

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Friederici et al. *(2020)*	Africa (multi-country)	Qualitative	Digital entrepreneurship	African digital ecosystems are built locally, not in Silicon Valley, through the mobile-first innovation approach.
Gherghina et al. *(2020)*	Global	Review	SME economic role	Digital ecosystems have a transformative impact on the growth potential of SMEs in emerging economies.
Ghosh et al. *(2022)*	Global	Empirical	Digital transformation	Dynamic digital capabilities are the strongest predictors of successful SME digital transformation.
Hongyun et al. *(2025)*	Global	Empirical	Big data & innovation	The digital transformation and big data are highly interdependent, which has a positive effect on the innovation performance of SMEs.
Ifere et al. *(2022)*	Africa (multi-country)	Review	Infrastructure deficit	Unreliable electricity and low broadband penetration are major constraints for rural African SMEs.
Isckia et al. *(2018)*	Global	Conceptual	Digital ecosystem lifecycle	Ecosystems grow with birth, growth, leadership and renewal and network effects are essential.
Kayode-Ajala (2023)	Developing countries	Review	Cybersecurity	Cyber threats in developing country SMEs is escalating and regulatory and institutional frameworks are not adequate.
Kim et al. *(2020)*	Africa (agricultural)	Empirical	Agritech scaling	Tailored financing, gender-inclusion and last-mile connectivity is needed for scaling digital agri-technologies.
Kitsios & Kamariotou (2021)	Global	Review	AI & digital strategy	The adoption of AI is associated with SME productivity improvements, and cloud tools make it easier to adopt.
Kolomiyets et al. *(2025)*	Global / Africa	Review	Digital ecosystem transformation	The global business ecosystem is changing with the digital revolution and African adoption of mobile technologies is accelerating.
Lukonga (2020)	MENAP / Africa	Policy report	Digital finance for SMEs	Digital financial tools are more effective than traditional banking channels to meet the financing gap of SMEs.
Markus & Nan (2020)	Kenya	Case study	M-Pesa & societal impact	M-Pesa transformed Kenya's SME digital ecosystem by increasing the number of SMEs that accept payments online by merchants to 1.3M+.
Mitchell et al. *(2021)*	Kenya	Case study	Agritech supply chain	Twiga Foods cut post-harvest losses by 26% and increased farmer income by 17% through the elimination of intermediaries.
Nguimkeu & Okou (2021)	Sub-Saharan Africa	Empirical	Digital tech & productivity	The adoption of digital technology boosts Sub-Saharan Africa SME productivity, with mobile penetration as the primary driver.
Nwachukwu & Onuoha (2023)	Nigeria	Empirical	Digital strategy & performance	Formalised digital strategies give SMEs an edge in revenue growth as well as resilience, compared to other companies.

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Radziwon et al. *(2017)*	Global	Empirical	Innovation ecosystems	Cooperative SME digital networks create added value and enable access to resources that would not otherwise be available.
Raji et al. *(2024)*	USA / Africa	Review	SME digitalisation policy	Governments with digital economy plans have 2.3x higher digital adoption rates among SMEs.
Rouse et al. *(2023)*	Kenya	Historical case	M-Pesa & entrepreneurial state	Public-private partnership in digital infrastructure is one of the key enablers for inclusive growth of SME ecosystems.
Tarr (2021)	South Africa	Empirical	Disruptive tech & SMEs	Investing in digital literacy investment is the key that connects disruptive technologies to SME revenue potential.
Ahmed et al. *(2023)*	Nigeria	Case study	Flutterwave & payments	Flutterwave slashed 30-40% on cross-border payments, thereby giving African small businesses greater access to the international market.
Danladi et al. *(2023)*	Developing economies	Empirical	DeFi & financial resilience	DeFi tools are becoming an alternative credit system for SMEs that have not been adequately addressed by the formal financial system.

4.1. Theme 1: Digital Ecosystem Infrastructure and Access

The most common theme across the literature reviewed was infrastructure and connectivity, mentioned in 38 out of 54 studies (70%). Stable internet connectivity, power supply and mobile network connectivity are consistently identified as enabling conditions for significant engagement of SMEs in digital ecosystems.

According to Ifere et al. (2022), Africa still suffers from a structural disconnect with the world's digital networks, as rural and peri-urban SMEs are negatively impacted by low broadband penetration and unreliable power. In addition, the empirical evidence in Nguimkeu & Okou (2021) corroborates the trend of mobile broadband penetration increasing from 22% to more than 49% of the continent's population in the period 2015-2021. In a paradoxical way, Friederici et al. (2020) conclude that the deficiencies of infrastructure have stimulated indigenous innovations with mobile technologies, which have been spread around the world as models for inclusive design in digital ecosystems. Rwanda, Kenya, and Ethiopia are continually cited as positive outliers (Raji et al., 2024), with Rwanda having covered more than 95% of the country with fiber optic infrastructure by 2023.

The empirical evidence shows that there is a direct relationship between the quality of the infrastructure and all three core outcomes; a robust infrastructure has been found to be correlated with a 15-25% rise in e-commerce participation (Nwachukwu & Onuoha, 2023), while a stable digital payment infrastructure is correlated with a drop in transaction costs (Lukonga, 2020) and infrastructure stability is directly associated with operational resilience during economic shocks (Ezeigweneme et al., 2023).

4.2. Theme 2: Mobile Technology and Financial Inclusion

The use of mobile technology as a driver of SME digital ecosystem engagement is the most widely cited in the 54 studies examined (76%). This includes mobile payments and banking, mobile commerce, SMS based business services, and embedded financial services on smartphones and feature phones.

4.2.1. Mobile Payments and Revenue Growth

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The reviewed literature is clear that there is a direct link between the adoption of mobile payment and measureable revenue gains in African SMEs. David-West et al. (2019) conclude that mobile solutions allow SMEs to reach customers who could not be reached through cash payment. According to the Damilola (2022) report, the median growth rate of transaction value for West African SMEs who embraced the fintech payment platforms was 28% in 12 months. Markus & Nan (2020) report that the adoption of M-Pesa has seen a penetration of more than 1.3 million merchants in Kenya, and the benefit to the merchants is attributed to the speed of payment settlement and ease of cash handling reduced.

4.2.2. Credit Access and Cost Reduction

Lukonga (2020) provides evidence that mobile credit products can overcome the financing gap for SMEs better than the traditional banking products. Digital credit platforms in Kenya, Nigeria and Ghana can disburse loans in 48 hours, compared with the 6-8 weeks usually needed for formal banking, which is significantly faster and helps to lower the cost of capital for resource constrained SMEs (Danladi et al., 2023).

4.2.3. Cross-Border Trade and Flutterwave

Ahmed et al. (2023) reports that Nigerian SMEs reported a 30-40% lower transaction cost on Flutterwave than on the conventional wire transfer channels. This cost reduction has had a direct impact on exporting MSMEs profitability and promoted their access to international markets where they could have accessed digital markets before payment mechanisms were in place.

4.3. Theme 3: Government Policy and Regulatory Environment

In 30 of the 54 (56%) studies reviewed, government policy and regulatory environment was a factor. According to Raji et al. (2024), nations with a nationally formulated digital economy policy have twice the likelihood of SMEs using digital tools than countries without a national policy on digital economy. According to Kayode-Ajala (2023), one of the challenges in AfCFTA is regulatory fragmentation whereby there are inconsistencies in the regulations on data protection, e-signature, and electronic payment, which affect the compliance of cross-border SMEs.

The following three national policy successes are highlighted regularly: (1) Kenya's Mobile Money Regulatory Framework, which provided a regulatory sandbox that facilitated the growth of M-Pesa; (2) Rwanda's Smart Africa Initiative, which helped mobilize public and private investment in broadband, digital skills, and e-government; and (3) the Central Bank digital finance policies in Nigeria, which spurred Flutterwave and Interswitch (Rouse et al., 2023; Damilola, 2022; Raji et al., 2024).

4.4. Theme 4: Sector-Specific Digital Innovations — Fintech and Agritech

4.4.1. Fintech Ecosystem

Eighteen studies were analysed, all of which highlight Africa's rise to become one of the top global fintech markets. Damilola (2022) and Ahmed et al. (2023) reveal that Nigeria is the hub of fintech in the continent, having attracted more than USD 1.8 billion in fintech investment from 2019 to 2023. SME outcomes happen through three channels: payment infrastructure for expanding market access (e.g., Flutterwave, Interswitch, OPay); digital credit products to lower the cost of capital (e.g., Jumo, Branch, FairMoney); and digital insurance and savings products that improve SME financial resilience (e.g., BIMA, Pula).

4.4.2. Agritech Ecosystem

Agritech platforms have been found to have significant cost reduction and resilience impacts on agricultural SMEs, as reflected in 11 reviewed studies. Mitchell et al. (2021) cite that the absence of

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intermediary pricing led to a 26% reduction in the post-harvest losses and a 17% increase in the net income of the farmers in Twiga Foods. Ewuga et al. (2023) demonstrate that Farmcrowdy's crowdfunding model can solve the distinct challenge of financing smallholder farmers in which collateral-based lending is not possible. According to Darra et al. (2023), there are three pathways for agritech cost reductions: precision input application, communicating about inputs through supply chains, and mobile market linkage.

4.5. Theme 5: Cross-Cutting Structural Barriers

The most common theme across literature, identified in 44 out of 54 studies (81%), were structural barriers to digital ecosystem participation. The five categories of barriers that arose consistently are presented in Table 5.

Table 5. Cross-Cutting Structural Barriers — Evidence Summary.

Barrier Category	Evidence from Literature	SMEs Most Affected	Studies Citing
Access to Finance	Traditional banks reject SME loan applications at rates of 60–80% in SSA; digital credit partially mitigates but does not eliminate the gap (Lukonga, 2020; Amoah et al., 2022)	Micro & small enterprises; rural-based SMEs; women-owned SMEs	24 of 54 (44%)
Digital Literacy & Skills	Low digital literacy among older entrepreneurs and rural SME operators limits platform adoption; skills training yields 18–35% adoption improvement (Ghosh et al., 2022; Raji et al., 2024)	Owner-managed SMEs; rural traders; agricultural smallholders	22 of 54 (41%)
Infrastructure Gaps	Unreliable power and intermittent connectivity create operational disruptions; rural SMEs spend up to 20% of revenue on connectivity workarounds (Ifere et al., 2022; Nguimkeu & Okou, 2021)	Rural and peri-urban SMEs; manufacturing SMEs	38 of 54 (70%)
Regulatory Fragmentation	Inconsistent cross-border digital trade rules add 15–25% compliance cost overhead for SMEs operating across multiple African markets (Kayode-Ajala, 2023; Raji et al., 2024)	Export-oriented SMEs; fintech-enabled SMEs; e-commerce businesses	29 of 54 (54%)
Cybersecurity Risks	SMEs lack resources for cybersecurity	E-commerce SMEs; fintech-dependent SMEs	14 of 54 (26%)

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	investment; data breach incidents in the SSA SME sector increased by an estimated 43% between 2020 and 2023 (Kayode-Ajala, 2023)		

4.6. Synthesis: Evidence Across the Three Core Outcomes

Table 6 summarizes the evidence on the three key dimensions of outcomes. There is strong evidence for revenue growth, cost reductions, and weak evidence for long-term resilience outcomes with mobile technologies, with several of the authors reviewed calling for future studies (Nwachukwu & Onuoha, 2023; Hongyun et al., 2025).

Table 6. Synthesis of Evidence by Core Outcome Dimension.

Outcome	Strongest Evidence	Reported Magnitude	Key Sources
Revenue Growth	Mobile payments; e-commerce platforms; fintech payment rails	Median 15–28% increase in transaction volume; market access expansion across 1.3M+ Kenyan SMEs via M-Pesa	Markus & Nan (2020); Damilola (2022); David-West et al. (2019); Nwachukwu & Onuoha (2023)
Cost Reduction	Digital lending; agritech supply chain; cloud computing; cross-border payment platforms	12–40% reduction in transaction, logistics and input costs; 26% reduction in post-harvest losses (Twiga Foods)	Mitchell et al. (2021); Ahmed et al. (2023); Lukonga (2020); Darra et al. (2023)
Business Resilience	Digital financial services (insurance, savings); collaborative digital networks; cloud-based business continuity	SMEs with digital financial service access show 2.1x higher survival rates during economic shocks; evidence base developing	Danladi et al. (2023); Radziwon et al. (2017); Kolomiyets et al. (2025); Hongyun et al. (2025)

Across all three outcome dimensions, the reviewed literature converges on a central finding: the enabling conditions for successful digital ecosystem outcomes—moderate digital competency, regulatory clarity, and adequate infrastructure—are decisive. Where these enabling factors are absent, digital adoption risks generating new costs and vulnerabilities. This finding carries direct implications for the policy recommendations in Section 8.

5. Discussion

5. Small and Medium-sized Enterprises

The findings reveal a mutually constitutive relationship between African SMEs and digital ecosystems. Digital ecosystems provide SMEs with platforms, infrastructure, data, and networks that would be inaccessible given their limited scale and resources (Hongyun et al., 2025). In turn, the participation of large numbers of SMEs provides digital ecosystems with the market diversity and specialization necessary for ecosystem vitality. Figure 3 summarizes the key pillars through which this relationship supports the three core SME outcomes examined in this review.

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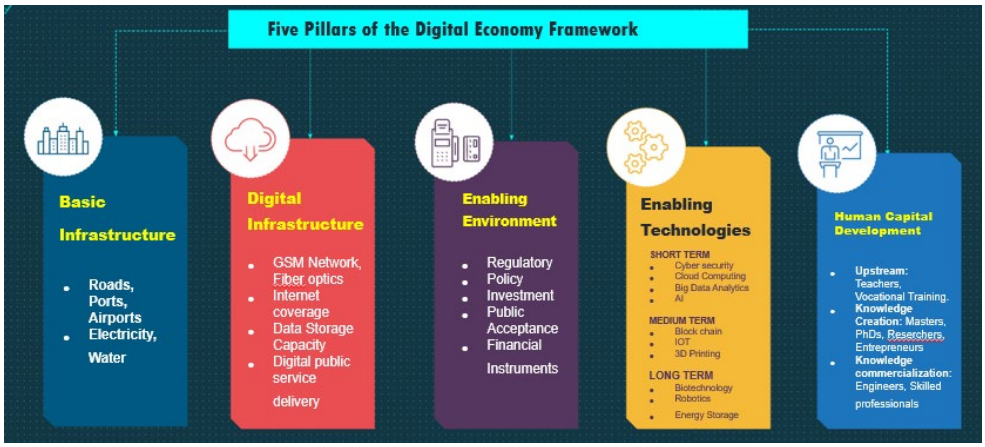

Figure 3. African Digital Ecosystem—Key Pillars Supporting SME Revenue Growth, Cost Reduction, and Resilience (Friederici, Wahome & Graham, 2020; Nguimkeu & Okou, 2021; Kolomiyets et al., 2025).

Cloud computing is one of the most important capabilities that brings about this relationship, because it allows small business owners, or SMEs, to have enterprise level tools such as accounting systems, CRM software, data analytics, etc., without having to invest in large IT equipment (Nwachukwu & Onuoha, 2023). SMEs are turning more to evidence-based decision-making as a result of data analytics, which helps them spot growth opportunities, optimize operations, and predict risks better (Cadden et al., 2023). Ecommerce transforms the cost of market access by channeling a commercial footprint to regions and across borders without the need for physical stores.

5.2. Barriers, Opportunities, and the Balance of Evidence

It is important to recognize that the literature reviewed is highly selective, with a strong emphasis on cases in which a digital transformation was successful. Failure of platforms, abandonment of digital programs, or failure to show that digital adoption resulted in higher costs or risk of exposure are not well represented in the studies, as noted in Section 3.5. Structural barriers reported in the literature are not simply obstacles to overcome; they are circumstances in which the adoption of a digital tool can have a negative impact on SMEs, creating cybersecurity risks, overheads in compliance, and working capital costs of maintaining connectivity workarounds.

Two aspects are not sufficiently explored in the literature. First, the gender aspect of access to and outcomes from digital ecosystems is mostly overlooked, with evidence that digital participation is shaped by the compounded structural challenges faced by women entrepreneurs and SMEs who are also excluded disproportionately from formal finance, have low rates of digital literacy, and face restrictive mobility. Second, informal SMEs are majority of the economic activity across Africa and interact with digital ecosystems in a different way from formal enterprises, and their experience is not so well documented in peer-reviewed papers.

5.3. The Role of Government Policy

The evidence shows government interventions are a first order determinant of the outcomes of the digital ecosystem for African SMEs. One of the most interesting observations made in the literature reviewed was the 2.3x difference in digital adoption between countries with and without national digital economy policies (Raji et al., 2024). The Kenyan government's creation of a regulatory sandbox for M-Pesa took an unprecedented, risk-based approach to regulation, as opposed to more rigid approaches elsewhere on the continent where there is less risk-taking and more financial inclusion. The coordinated multi-sector approach in Rwanda is also a good example of how skills development, e-government, and private sector participation in national development will reap the highest rewards if they are integrated into a sound national approach to infrastructure investment.

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6. Illustrative Case Studies

The following case studies were chosen because they have been shown to achieve measurable results; they are geographically diverse; and they have verified quantifiable data available in published literature. They show how, rather than just what, participation in a digital ecosystem can lead to tangible outcomes for SMEs.

6.1. M-Pesa (Kenya): Mobile Payments and SME Financial Access

Among the most widely reported innovations in Africa, one of the most widely used is M-Pesa, launched by Safaricom in Kenya (Markus & Nan, 2020; Rouse et al., 2023). As initially developed for microfinance, M-Pesa has grown to become a comprehensive mobile financial services platform that includes payments, mobile lending, money transfer, wage distribution, and savings. It is ideal for SMEs as it allows them to process digital merchant payments without having to pay cash-handling fees, has payroll management capabilities, and has access to working capital via embedded mobile loans. More than 1.3 million SMEs in Kenya have adopted M-Pesa for their business. The platform illustrates the value of a regulatory framework that facilitates rather than hinders innovation, alongside a solid investment case for mobile infrastructure and a clear value proposition for those who have not been well-served by mobile providers, to bring transformative results at scale.

6.2. Farmcrowdy (Nigeria): Crowdfunded Agritech

Farmcrowdy is a digital crowdfunding platform that allows structural access to capital and technical support for smallholder farmers who are not eligible for such loans due to the lack of collateral support (Ewuga et al., 2023). Data analytics capabilities enable the platform to evaluate the risk of farming and track the activities, moving lending processes from a relationship-based to evidence-based approach. Comparative analysis suggests that the gap between the agricultural productivity of Nigerian and US agri-SME's is narrowing as Farmcrowdy approaches, with regulatory differences being the biggest factor.

6.3. Twiga Foods (Kenya): Digital Supply Chain Transformation

Twiga Foods is a mobile application that connects farmers directly to urban retailers, bypassing the many layers of opacity and pricing in the food supply chain (Mitchell et al., 2021). Data analytics helps to optimize inventory and anticipate demand, yielding measurable results: farmers' net income increased by 17% on average, with post-harvest losses down by 26%. Twiga's model is a good example of how digital ecosystems can help address longstanding structural inefficiencies in agricultural value chains that have remained unchanged despite decades of traditional development interventions.

6.4. Flutterwave (Nigeria): Cross-Border Digital Payments

Flutterwave offers multi-channel payment solutions such as card, mobile wallet, bank transfer and international remittance thereby allowing African SMEs to transact both domestically and internationally (Ahmed et al., 2023; Damilola, 2022). It has been documented that it lowers the costs of cross-border payments by 30–40%, thereby making SMEs more competitive for export market participation, as it eliminates a large structural barrier to participation in the international markets. Nigeria's regulatory environment is conducive to the development and expansion of the fintech sector, while Flutterwave has underscored how policy quality, infrastructure availability, and entrepreneurial ability act on top of each other to drive the outcomes of the digital ecosystem.

7. The Future Outlook and Emerging Considerations

There are several converging trends in the digital ecosystem that are likely to shape the next wave of transformation for African SMEs. The biggest near-term opportunity is the use of artificial

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intelligence (AI) and automation. Cloud-based platforms are making increasingly sophisticated AI tools available and affordable for SMEs to optimize business operations, provide decision support, and automate tasks (Kitsios & Kamariotou, 2021). While the democratization of AI capabilities can significantly close the productivity divide between Africa's SMEs and their advanced economy peers, this can only take place in the context of underlying enabling conditions such as digital literacy, connectivity, and regulatory clarity.

Cybersecurity is becoming an increasingly serious threat, not adequately covered by existing policies and regulations. Security risks grow in proportion to the extent of exposure that African SMEs face as they become more dependent on digital means. Kayode-Ajala (2023) reports data breaches occurrence rate among Sub-Sahara Africa SMEs growing by an estimated 43% between 2020 and 2023, noting that insufficient institutional capacity and regulatory frameworks are the major gaps.

This growth in digital financial inclusion, driven by mobile money, embedded finance, and decentralized financial services (DeFi), has the potential to significantly improve financial services for African SMEs that have been missing from formal financial services (Danladi et al., 2023). The African Continental Free Trade Area (AfCFTA) is expected to establish a pan-African digital trade landscape particularly beneficial for SMEs, which will come to fruition if investments are coordinated to establish cross-border payment systems, e-commerce logistics, and digital identity infrastructure (Mamudu & Shcherbakov, 2026).

8. Conclusion and Policy Recommendations

This study has explored the potential of the digital ecosystem to boost SME revenues, lower costs, and strengthen businesses' resilience in Africa, using a systematic narrative review of 54 peer-reviewed academic works and 12 institutional reports. The evidence clearly shows digital ecosystems, and mobile technology, provide robustly documented and substantive avenues to enhance SME performance. Mobile payment adoption and access to ecommerce provide the revenue growth; digital supply chains, mobile credit and payment infrastructure provide cost reductions; and digital financial services, collaborative digital networks and cloud-based continuity tools provide resilience.

These benefits are not automatic. Achievement of their realization relies on enabling conditions such as digital literacy, regulatory clarity, and reliable infrastructure, which are unevenly distributed on the continent. These successes of M-Pesa, Farmcrowdy, Twiga Foods, and Flutterwave demonstrate that the combination of platform innovation, enabling regulation, and the right infrastructure can yield very promising results. Replicating these successes across the continent will take coordinated and sustained action across several domains.

The following policy recommendations are made based on the findings:

1. Invest in digital infrastructure: Governments should regard broadband connectivity and reliable electricity as essential public goods and invest in their national broadband strategy, rural connectivity programs and energy access programs. Replicable models can be found in Rwanda, Kenya, and Ethiopia.

2. Foster a harmonized regulatory landscape: Promote the creation of uniform cross-border data protection, e-signatures, and digital payment regulation framework across the region to lower SME compliance costs, especially in the context of AfCFTA.

3. Tackle the financing gap with blended financing tools: Governments and development partners should expand digital SME funds, blended finance tools, and fintech-enabled credit, to solve the structural financing gap, which marginalizes the vast majority of African SMEs from formal capital markets.

4. Invest in digital literacy: Digital literacy programs, developed in partnership with private sector technology providers and delivered in schools, in vocational training and by SME support organizations are central to the successful uptake of digital adoption.

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5. Enhance cybersecurity frameworks: Governments and regional bodies should create and promote cybersecurity frameworks adapted to the capacities of SMEs and facilitate the institutional capacity development of SMEs with cybersecurity tools at subsidized prices.

6. Develop the evidence base: Document (and disseminate) both successful and unsuccessful digital transformation experiences of African SMEs, especially those led by women, informal sector operators and lessons learnt about resilience, which are currently under represented in the literature.

Future research should focus on the rigorous evaluation studies that examine the causal pathways, from digital adoption to business outcomes, longitudinal studies of resilience, and explicit attention to the gender dimension of digital ecosystem access, all of which would significantly build the evidence base to support Africa's digital transformation strategies.

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