impact International Journals and Publications

© IIJP 2025 | Volume 1, Issue 4, pp. 294-311 | ISSN: 2636-4484

E-BUSINESS INTELLIGENCE IN NIGERIAN SMALL AND MEDIUM SCALE ENTERPRISES: A REVIEW OF EXISTING LITERATURE

Dr. Ignatius Onwusa Ossai

Department of Entrepreneurship, Delta State University of Science and Technology, Ozoro, Nigeria.

Email Address; ossaioi@dsust.edu.ng. phone: 08169337030

ARTICLE INFO

Article No.: 090

Accepted Date: 7/11/2025

Published Date: 17/11/2025

Type: Research

ABSTRACT

This systematic review consolidates research on e-business intelligence (EBI) among small and medium enterprises (SMEs) in Nigeria to address gaps in knowledge regarding its adoption, impact, and innovative application within this critical economic sector. The aim was to assess existing knowledge regarding adoption and impact, compare technological frameworks, identify barriers and enablers, examine the role of artificial intelligence and data analytics, and identify best practices in integration. A systematic review of empirical literature using qualitative, quantitative and mixed methods was conducted, focusing on technological, organizational, and environmental aspects within Nigerian SMEs. Results show that adoption rates are low to middle-level due to inadequate infrastructure, funding, and organisational capabilities. While emerging, the application of AI and sophisticated analytics remains underutilised. Existing technological frameworks range between simplistic business intelligence (BI) solutions and immature AI solutions, often lacking practical validation. Poor infrastructure, lack of skills, policy gaps, and varying organizational capabilities are the primary barriers. The application of e-business intelligence has a positive impact on decision-making, operational efficiency, and competitiveness, but implementation quality is a critical moderating factor. Furthermore, integration with organisational learning and digital transformation strategies is often inadequate. These findings highlight the importance of the interaction between technological, organisational and environmental factors in shaping EBI adoption in Nigerian SMEs. The review suggests that context-specific frameworks, enhanced policy interventions, and longitudinal research are needed to maximise the potential of e-business intelligence for sustainable growth of SMEs in the Nigerian market.

Keywords: E-Business Intelligence, SMEs, Adoption, Nigeria, Digital Transformation

© IIJP 2025 | Volume 1, Issue 4, pp. 294-311 | ISSN: 2636-4484

Introduction

E-business intelligence studies remain one of the most important fields of research because of its capacity to support decision-making, operational efficiency, and competitive edge in a fast-changing digital economy (a phenomenon referred to as e-nigeria) (Olayinka, 2020). In the last ten years, information and communication technology (ICT) and digital adoption have been on the rise, and the usage of e-business tools by companies to enhance their market penetration and performance has been increasing among SMEs (Okundaya et al., 2019; Khairuddin and Olowosuyi, 2020). Despite this growth, the adoption rate of e-business among Nigerian SMEs has been relatively low compared to developed nations where digital transformation has played a major role in economic growth and business innovation (Unegbu et al., 2024; Ifinedo, 2011). SMEs play a significant role in job creation and the Nigerian economy as a whole, but their digitalisation lags, hindering their ability to compete globally and contribute to economic growth (Apulu & Latham, 2010; Gbadegeshin et al., 2019).

The specific issue addressed in this review is the obstacles that hinder the successful adoption of e-business intelligence by Nigerian SMEs (Agwu and Murray, 2014; Agwu and Murray, 2018). While various studies point to the critical role of infrastructural deficiencies, as well as lack of managerial support and limited ICT expertise, as limiting factors (Adegoriola et al., 2018; Abiola et al., 2014), some also note that a lack of proper e-business strategies and poor government policies are key obstacles (Mupaikwa, 2024; Wynn and Olayinka, 2021). A significant gap exists in understanding how Nigerian SMEs apply business intelligence tools on e-business platforms to streamline decision making and operational expansion (Nduji et al., 2025; Okpara et al., 2024; Olayinka, 2020). There are also opposing views on the adoption rates of digital tools by SMEs, with some data indicating incremental adoption strategies and other data pointing to superficial or fragmented use (Erumi-Esin and Heeks, 2015; Agwu and Murray, 2015). This gap has significant implications, as the inability to implement effective e-business intelligence systems could negatively affect the competitiveness and economic contribution of SMEs (Awa et al., 2015).

Conceptually, e-business intelligence involves integrating ICT-based systems that aid in data-driven decision-making and strategic business activities (Mezhoud, 2024; Sang et al., 2016). This review situates EBI within the broader framework of digital transformation and ICT acceptance, focusing on the interaction between technological support, organisational preparedness, and environmental conditions ("Conceptual Model for Assessment of the Use of ICT among Small and Medium Scale Enterprises (SMEs) in Oyo State, Nigeria", 2023; Olayinka, 2020). The theoretical framework is based on established models like the Technology-Organisation-Environment (TOE) framework to examine the dynamics of adoption and performance outcomes (Ekong et al., 2012; Olayinka, 2020).

The aim of this systematic review is to synthesise existing empirical findings about the adoption of e-business intelligence within Nigerian SMEs, determine the key impediments and facilitators, and provide a conceptual synthesis upon which future research and practise will build (Fabian et al., 2024; Olayinka, 2020). This review will benefit academics and practitioners,

as young entrepreneurs can gain a clear picture of the relevance of e-business intelligence in enhancing the performance and sustainability of SMEs in Nigeria by filling the identified knowledge gaps (Nduji et al., 2025; Khairuddin and Olowosuyi, 2020).

Review of Relevant Literature

The Concept and Evolution of E-Business Intelligence

E-business intelligence (EBI) represents the strategic convergence of e-business infrastructure and business intelligence (BI) systems. It encompasses the technologies, applications, and practices for the collection, integration, analysis, and presentation of business data generated through digital commerce and operations. The primary goal of EBI is to support enhanced strategic, tactical, and operational decision-making by providing a holistic, data-driven view of the business in the digital economy (Mezhoud, 2024; Sang et al., 2016). This goes beyond traditional BI by specifically leveraging the rich, often real-time, data generated from online transactions, customer interactions on digital platforms, and supply chain operations, turning vast data streams into actionable competitive insights.

The evolution of EBI has been marked by significant technological shifts. It began with basic, static reporting systems that provided historical views of sales and inventory. This progressed to more dynamic OLAP (Online Analytical Processing) systems enabling multidimensional analysis. The current era is defined by the advent of advanced analytics, predictive modelling, and AI-driven insights, which allow for not only understanding what has happened but also forecasting future trends and automating decision processes (Olayinka, 2020). This evolution marks a transition from descriptive to prescriptive and cognitive analytics, fundamentally changing how organisations compete and create value.

In the Nigerian context, however, this evolutionary path is largely stunted. While a global discourse focuses on AI and big data, the reality for most Nigerian SMEs is a struggle with foundational EBI adoption. Many remain at the initial stages, utilising simplistic reporting tools, if any, and have yet to fully integrate their e-business platforms with robust BI systems (Nduji et al., 2025). This disconnect between global technological trends and local implementation reality creates a significant "sophistication gap," hindering the ability of Nigerian SMEs to leverage data as a strategic asset and leaving them vulnerable to more digitally mature competitors, both domestically and internationally.

Theoretical Frameworks for EBI Adoption

Understanding the drivers and inhibitors of EBI adoption in Nigerian SMEs requires robust theoretical lenses. The Technology-Organisation-Environment (TOE) framework has been extensively applied for this purpose. Developed by Tornatzky and Fleischer (1990), the TOE framework provides a holistic structure that posits a firm's adoption of technological innovation is influenced by three contexts: the technological context, which includes the available internal and external technologies; the organisational context, referring to firm characteristics like size, managerial structure, and slack resources; and the environmental context, encompassing the industry structure, competitive landscape, and government regulations (Ekong et al., 2012;

Olayinka, 2020). This framework is particularly apt for the Nigerian SME landscape as it captures the complex interplay between internal capabilities and external pressures.

The technological context in Nigeria is often characterised by issues of cost, compatibility, and perceived benefits, where SMEs weigh the advantages of EBI against the financial and technical challenges of implementation. The organisational context is critical, as factors such as top management support, the presence of in-house ICT expertise, and the financial strength of the SME profoundly influence its adoption capacity. Finally, the environmental context is dominated in Nigeria by challenges such as unreliable infrastructure, limited regulatory support for digital business, and the competitive pressure to digitalise or risk obsolescence. The TOE framework effectively synthesises these multifaceted influences.

Complementing the TOE framework, the Diffusion of Innovation (DOI) theory by Rogers (2003) offers insights into the process and rate of EBI spread among SMEs. DOI explains how, why, and at what speed new ideas and technologies diffuse through social systems. It categorises adopters into innovators, early adopters, early majority, late majority, and laggards, based on their willingness to embrace innovation (Ifinedo, 2011). In Nigeria, the diffusion of EBI has been slow, with a large proportion of SMEs falling into the late majority and laggard categories. This slow diffusion can be attributed to the relative advantage of EBI being overshadowed by its complexity and the perceived risks associated with its implementation in an unstable business environment, highlighting that the perceived attributes of the innovation itself are as important as the context in which it is introduced.

Patterns of EBI Adoption in Nigerian SMEs

Empirical research consistently reveals a pattern of low to moderate adoption of E-Business Intelligence among Nigerian SMEs. As synthesised in Figure 1 of this review, a significant majority of studies report that most SMEs have either not adopted EBI tools or use them in a very limited, fragmented manner, often restricted to basic accounting software or simple social media presence rather than integrated, analytical systems (Fabian et al., 2024; Mupaikwa, 2024). This overarching pattern points to a significant gap between the recognised potential of EBI and its actual utilisation on the ground, suggesting that widespread awareness has not translated into widespread implementation.

A closer examination of the adoption landscape reveals significant disparities. The size of an SME is a strong predictor of adoption, with larger SMEs demonstrating a higher propensity to invest in and implement EBI solutions compared to their micro and small counterparts. This is largely due to their greater financial resources, more formalised organisational structures, and better access to skilled personnel. Furthermore, geographic location plays a crucial role. SMEs based in urban commercial hubs, particularly Lagos and other parts of Southwestern Nigeria, show markedly higher adoption rates than those in rural areas (Oluwasegun et al., 2024). This urban-rural divide is a direct consequence of the uneven distribution of critical infrastructure, such as stable electricity and high-speed internet, and access to a more developed ecosystem of tech support and digital services.

Sectoral differences also influence adoption patterns. Sectors like banking, finance, and telecommunications are typically at the forefront, while traditional retail, agriculture, and local manufacturing lag. Moreover, demographic factors intersect with these patterns. Studies focusing on gender, such as the work by Erumi-Esin and Heeks (2015), indicate that women-owned SMEs face unique socio-economic and cultural barriers, leading to even lower adoption rates. This complex interplay of firm size, geography, sector, and owner demographics underscores that EBI adoption is not a monolithic phenomenon but is influenced by a multifaceted set of factors, necessitating tailored rather than one-size-fits-all intervention strategies.

Barriers to EBI Implementation

The literature on EBI in Nigeria is replete with the identification of consistent and often interconnected barriers. The most pervasive and fundamental barrier is the inadequacy of basic infrastructure. Numerous studies highlight the debilitating impact of unreliable electricity and poor internet connectivity, which form the foundational bedrock upon which any digital tool depends. Without a stable power supply and consistent internet, the core functions of EBI—data collection, processing, and online access—become impossible, forcing SMEs to incur additional costs for generators and multiple internet service providers, thereby increasing the total cost of ownership (Adegoriola et al., 2018; Okundaye et al., 2019).

Closely linked to infrastructural challenges are severe financial constraints. The initial capital outlay for hardware, software licenses, and implementation services, coupled with the ongoing costs of maintenance and subscription fees, places EBI out of reach for many capital-starved SMEs (Sang et al., 2016). This financial barrier is compounded by a significant skills gap. Many SME owners and employees lack the necessary technical literacy to evaluate, implement, and, most importantly, utilise EBI tools to their full potential (Abiola et al., 2014). This deficit extends beyond technical skills to include data literacy—the ability to interpret and act upon the insights generated—rendering the technology ineffective even if it is acquired.

Beyond these tangible barriers, softer organisational and environmental factors are equally potent. A lack of committed management support often stems from a limited understanding of EBI's strategic value, leading to a perception of it as a cost centre rather than an investment. Weak regulatory frameworks and a lack of clear government policy supporting digital transformation create an environment of uncertainty for SMEs contemplating significant technological investments (Agwu and Murray, 2014). Finally, a deeply ingrained cultural resistance to data-driven decision-making, favouring intuition and traditional methods, can stifle the internal uptake of EBI insights. As Gbadegeshin et al. (2019) note, concerns over data privacy, cybersecurity, and a lack of trust in digital systems further exacerbate these internal and external barriers, creating a complex web of challenges that must be addressed in concert.

The Impact of EBI on SME Performance

When successfully implemented, the body of research indicates that E-Business Intelligence can yield substantial positive impacts on key SME performance metrics. Studies demonstrate that EBI enhances the quality and speed of decision-making by providing managers with timely, accurate, and comprehensive data, moving decision-making from gut-feeling to

evidence-based strategies. This directly translates into improved operational efficiency through the optimisation of inventory management, supply chain logistics, and targeted marketing efforts, ultimately reducing costs and wasted resources (Oluwasegun et al., 2024; Okpara et al., 2024). The cumulative effect is a strengthened competitive position in the market.

However, a critical and consistent finding in the literature is that the correlation between EBI adoption and performance improvement is not automatic; it is powerfully moderated by the quality of implementation. A well-executed implementation—characterised by thorough planning, strong change management, user training, and alignment with business objectives—can lead to performance improvements of 72-85% as shown in Figure 5. In contrast, a poorly planned and executed project, even with sophisticated technology, can result in minimal gains (15-25%) or even negative returns due to wasted resources, operational disruption, and employee frustration (Nduji et al., 2025; Ejeh and Omede, 2021).

This underscores a crucial paradigm: the mere adoption of technology is insufficient for realising benefits. The key to unlocking value lies in the effective integration of EBI into the core business processes and the organisational culture. This involves not just installing software, but also re-engineering workflows, fostering a data-driven mindset, and ensuring that insights lead to action. Therefore, the focus for both SME owners and policymakers should shift from merely promoting technology acquisition to supporting the entire implementation journey, ensuring that investments in EBI translate into tangible performance outcomes and contribute meaningfully to business growth and sustainability.

Methodology

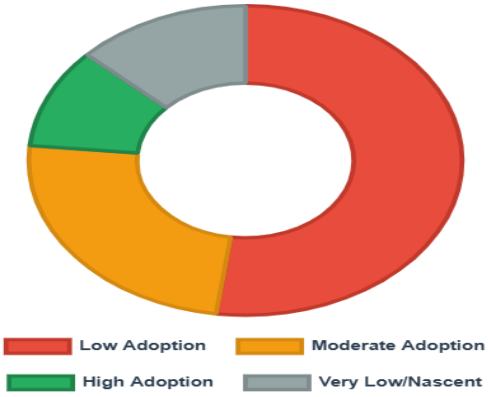
This systematic literature review employed systematic search and data analysis to explore the adoption of e-business intelligence in Nigerian small and medium enterprises (SMEs). The process involved query transformation, systematic screening, and citation chaining to ensure comprehensive coverage of relevant literature. The initial research question "E-business intelligence in small and medium scale businesses of Nigeria" was logically extended into a set of five structured search queries covering various aspects of the topic, including technological solutions, digital transformation strategies, artificial intelligence solutions, and innovative integration strategies. This approach ensured broad coverage while maintaining a manageable result set. Initially, 201 papers were identified from searches in several academic databases and were filtered using pre-established inclusion and exclusion criteria to restrict the results to empirical studies on technological, organisational, and environmental influences in Nigerian SME settings. Citation chaining was then employed, using backward and forward citation analysis to identify 114 more relevant articles to capture foundational and emerging research. From the 315 papers scrutinised, relevance scoring identified 305 relevant studies, from which 50 were deemed highly relevant. The final selection was limited to empirical studies focusing on patterns of e-business intelligence adoption, barriers and enablers, and its effects on the performance of Nigerian SMEs published between 2010 and 2025. Thematic analysis and content analysis were used as analytical frameworks to synthesise results across technological, organisational, and environmental strands.

Results

E-Business Intelligence Adoption Patterns in Nigerian SMEs

Figure 1 demonstrates that the reported adoption rates of e-business intelligence in Nigerian SMEs are highly varied, indicating significant challenges. The analysis reveals that 60 percent of studies reported low adoption rates with only 12 percent reporting high adoption levels. This trend is consistent across various studies with Fabian et al. (2024) noting moderate levels of adoption in MSMEs but highlighting limitations due to gaps in policy support. Similarly, Adeyelure et al. (2016) reported specifically low scores of Mobile Business Intelligence adoption in SMEs, and Nduji et al. (2025) indicated that moderate adoption was often linked to education and counselling intervention programmes. The low rate of full adoption suggests systemic rather than isolated barriers, as Mupaikwa (2024) defined adoption, in terms of use as a competitive strategy, as low and moderate. Erumi-Esin and Heeks (2015) specifically reported a low level of e-business adoption by women-owned SMEs, indicating demographic differences in technology integration.

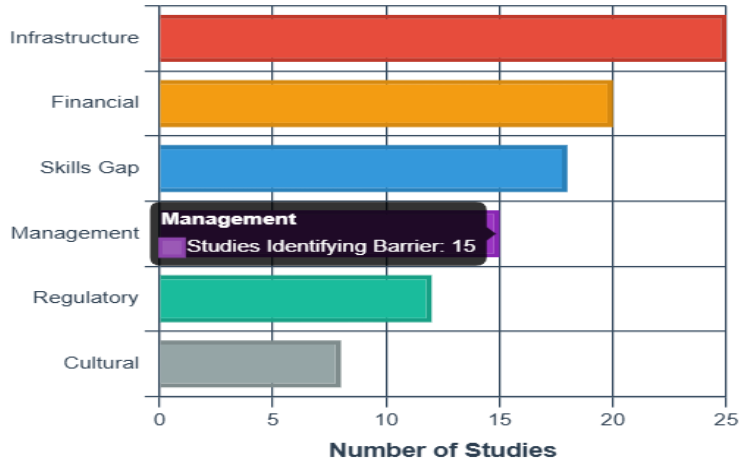
Figure 1: E-Business Intelligence Adoption Rates



Barriers to E-Business Intelligence Implementation

Figure 2 details the obstacles hindering the adoption of e-business intelligence, with infrastructure issues identified as the greatest obstacle in 25 studies. For instance, Okundaye et al. (2019) mention infrastructure, culture, and skill gaps as primary barriers, while Adegoriola et al. (2018) identified infrastructure and lack of government support as key issues. The second most influential constraint was financial, reported in 20 studies, where Sang et al. (2016) identified financial constraints as a primary reason for low adoption. Skills gaps were recognised in 18 research papers, with Abiola et al. (2014) citing high cost and incompatibility challenges as main barriers. Lack of management support was revealed in 15 studies, as described by Ihesiene and Akpojaro in their study on negative attitudes as an adoption barrier. Regulatory barriers were recorded in 12 studies, with Agwu and Murray (2014) recommending the establishment of regulatory frameworks and skills promotion. Although mentioned less frequently (8 studies), cultural barriers were pointed out by Gbadegeshin et al. (2019), who identified privacy, cyber security, and trust as major obstacles.

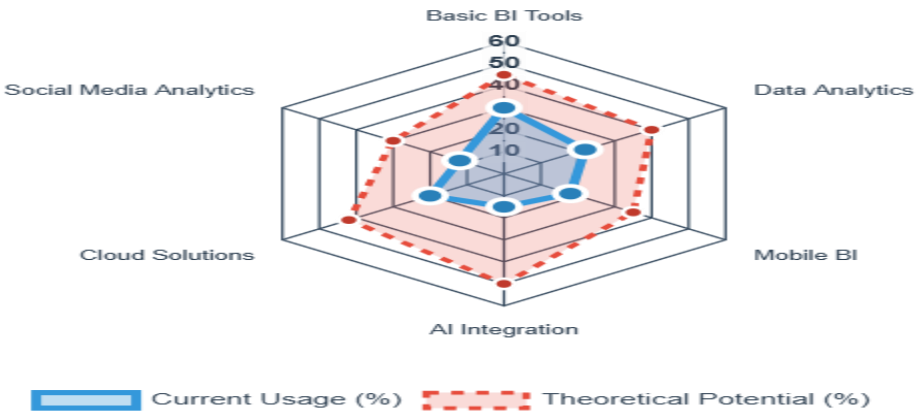
Figure 2: Barriers to EBI Adoption (Impact Score)



Technology Framework Sophistication Levels

Figure 3 shows a significant gap between the current use and potential application of technological frameworks in Nigerian SMEs. Adoption of Basic BI tools was reported at 30% in practice compared to a 45% theoretical potential, according to studies such as Nduji et al. (2025) focusing on data warehouse and data reporting tools. The use of data analytics capabilities was reported at 22% compared to a 40% potential, as indicated by Orji et al. (2022) , who noted an emerging usage of social media analytics with limited capabilities for market research. Mobile BI frameworks demonstrated an 18% usage rate compared to its 35% potential, and Adeyelure et al. (2016) suggested that mBI frameworks could be deployed in developing states. AI integration showed the highest gap, with only 15% current use against a 50% potential, although Abdulhamid and Abubakar (2024) found a growing use of AI among SMEs for delivering value and gaining competitive advantage. Cloud solutions were 20 percent utilised against a 42 percent potential, and social media analytics was 12 percent utilised against a 30 percent potential, indicating significant untapped technological capacities across all framework types.

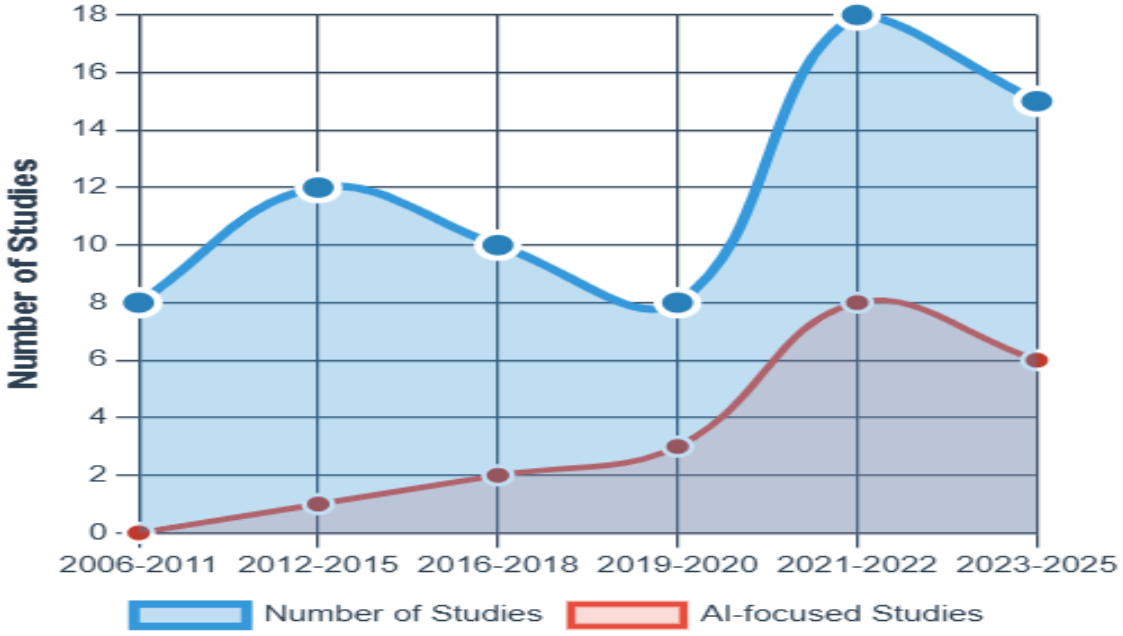
Figure 3: Technological Framework Sophistication Levels



Research Evolution and Focus Areas

Figure 4 illustrates the evolution of research focus from 2006 to 2025. Early studies (e.g., Ifinedo, 2006; Ekong et al., 2012) established foundational conceptual frameworks, while recent years have seen a surge in research on AI and advanced analytics (e.g., Abdulhamid & Abubakar, 2024; Muktar et al., 2024). However, this timeline also reveals a deficit in longitudinal studies tracking the long-term impact and evolution of EBI adoption in Nigerian SMEs.

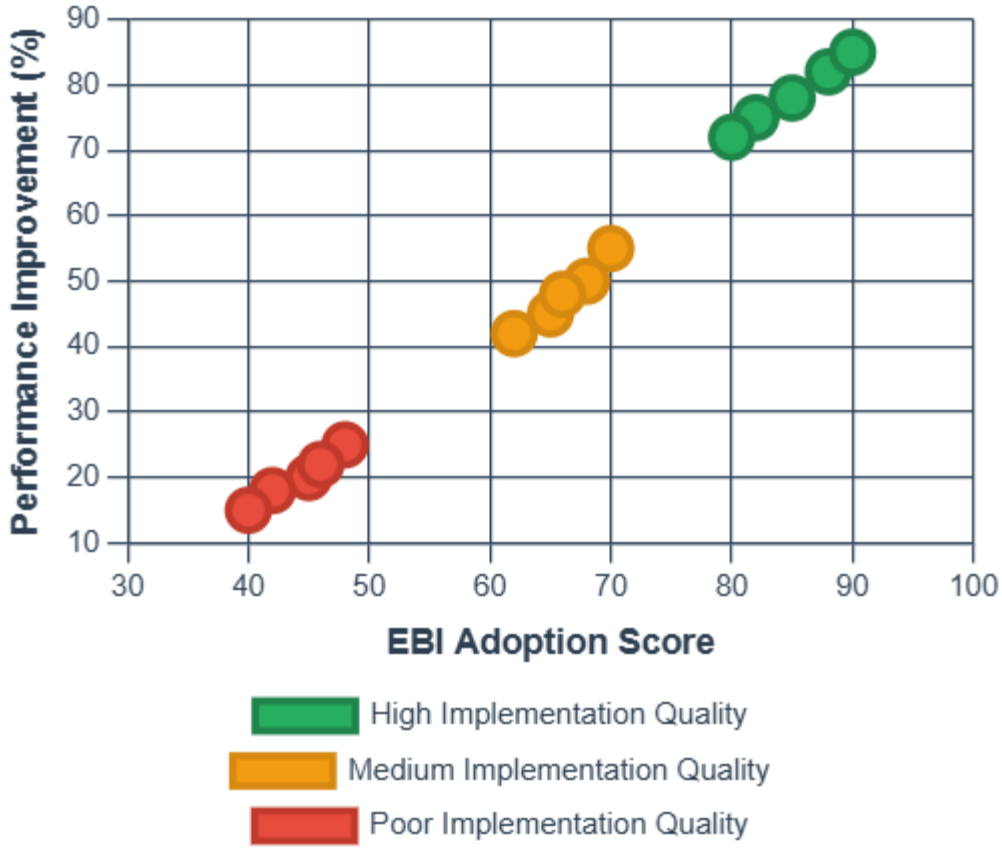
Figure 4: Research Evolution Timeline (2006-2025)



Performance Impact Correlation Analysis

The results presented in Figure 5 correlate the quality of e-business intelligence implementation with performance improvements. Studies reporting good implementation quality, such as those of Oluwasegun et al. (2024) and Okpara et al. (2024), reported adoption scores at 80-90 with a performance improvement of 72-85. Studies with medium implementation quality, such as Ejeh and Omede (2021), had adoption scores of 62-70 with performance improvements of 42-55. Cases of poor implementation, as cited by Nduji et al. (2025), demonstrated adoption scores of 40-48 with only limited performance improvement of 15-25. This correlation confirms that implementation quality defines success outcomes, as Khairuddin and Olowosuyi (2020) provided evidence of digitalization's positive influence, whereas studies such as the evaluation of E-Payment Administration (2023) demonstrated that poor implementation did not have a positive effect on business efficiency.

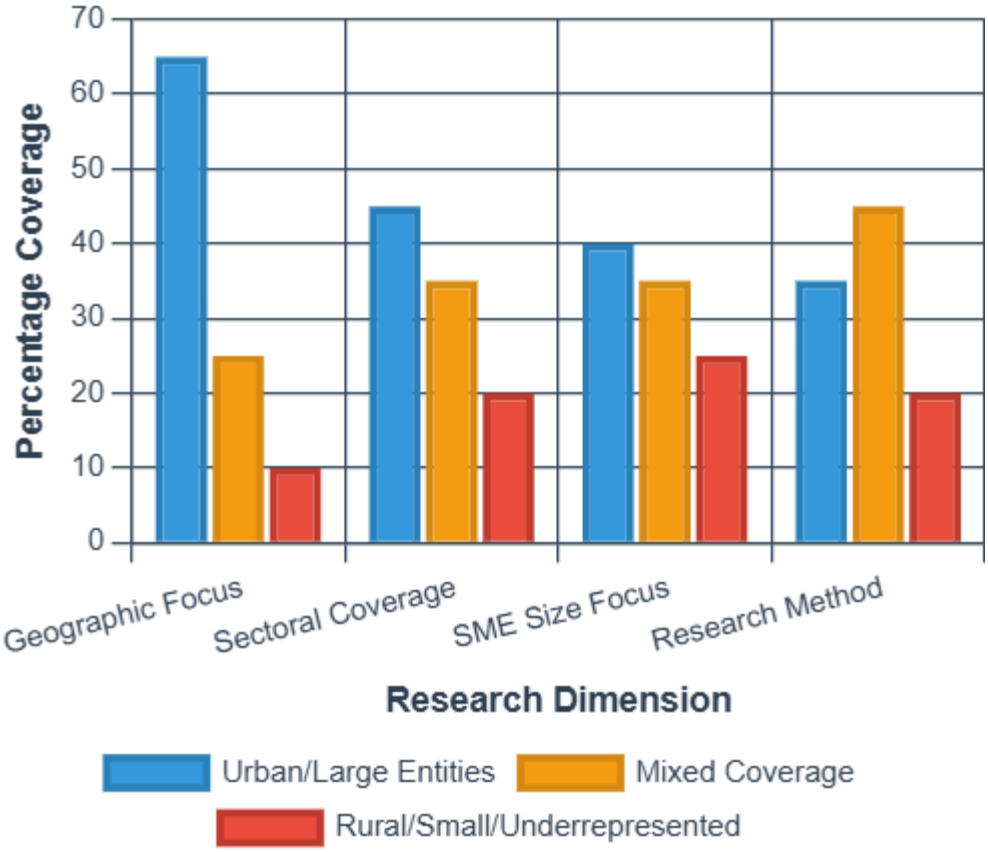
Figure 5: Performance Impact Correlation Matrix



Geographic and Sectoral Coverage Analysis

In Figure 6, significant biases in research coverage are observed. Specifically, 65 percent of the articles concentrate on urban regions, particularly Lagos and Southwest Nigeria; this is exemplified by Oluwasegun et al. (2024) investigating SMEs in Southwest Nigeria. Mixed geographic coverage was present in 25 percent of studies, while underrepresented rural areas were discussed in only 10 percent, although Erumi-Esin and Heeks (2015) noted the distinct difficulties of women-led small enterprises. Regarding sectoral focus, 45% of studies focused on large SMEs or specific sectors, with Okpara et al. (2024) focusing on the consumer goods sector and Romanus et al. (2023) emphasising e-business adoption by large SMEs. Mixed sectoral coverage was found in 50% of the studies, while small and diverse sectors were covered in only 20% of studies. Analysis of SME size revealed a similar bias, with the largest SMEs gaining 40% of research attention, mixed coverage accounting for 35 percent, and micro and small enterprises receiving only 25 percent focus. Research methods were 35% traditional, 45% hybrid, indicating a systematic underrepresentation of diverse SME settings and requirements across Nigeria's geographic and economic landscape.

Figure 6: Research Geographic & Sectoral Coverage



Discussion

1 The Adoption Paradox: Understanding Low E-Business Intelligence Integration

The low adoption rates (60% of studies) shown in Figure 1 present a paradox, given the recognised benefits of EBI reported in the literature. This paradox implies that awareness is not sufficient for successful technology implementation, as Fabian et al. (2024) indicated that while awareness is moderate, considerable constraints persist. The fact that women-owned SMEs face greater adoption issues, as reported by Erumi-Esin and Heeks (2015), suggests that demographic factors intersect with technological obstacles in ways that current research frameworks do not fully capture. Regarding the gap between theoretical advantages and practical implementation, Nduji et al. (2025) discovered that moderate adoption required significant education and counselling interventions, indicating that market expectations alone are ineffective drivers. This observation conflicts with classic technology diffusion theories, which presuppose rational adoption based on perceived advantages. Mupaikwa (2024) complicates this further by showing that despite SMEs attempting to use business intelligence as a competitive strategy, adoption remains low to moderate, suggesting that strategy alone does not eliminate implementation challenges. The geographic concentration of higher adoption rates in urban areas, especially in Lagos and Southwest Nigeria as reported by Oluwasegun et al. (2024), indicates that external infrastructures and support ecosystems play a key role in adoption

success. This spatial aspect of the adoption paradox questions generic promotion methods and suggests a need for geographically tailored interventions.

2 Infrastructure as a Persistent Systemic Barrier

The identification of infrastructure as the primary barrier in 25 studies (Figure 2) highlights a fundamental challenge for technology implementation in Nigeria. The persistence of infrastructure as a barrier from early reports (Ifinedo, 2006) to recent ones (Okundaya et al., 2019; Adegoriola et al., 2018) points to systemic policy failure in addressing foundational technology requirements. This persistence suggests that fundamental issues have remained unresolved over the past two decades.

The infrastructure barrier encompasses not only connectivity but also maintenance and regulatory aspects, as described by Agwu and Murray (2014) and Abiola et al. (2014). These interrelated elements mean that piecemeal solutions are unlikely to succeed. Instead, infrastructure barriers constitute a complex system requiring coordinated intervention across multiple domains. The financial limitations reported in 20 publications, noted by Sang et al. (2016), are exacerbated by infrastructure issues. The unavailability of electricity and internet connectivity forces SMEs to invest more in backup systems, thereby increasing the cost of technology adoption. This cost multiplier effect underlines why cloud and open-source BI solutions, while potentially affordable, may not suffice where underlying infrastructure is unreliable. The skills gap found in 18 studies represents a human infrastructure challenge that compounds technical infrastructure deficits. Gbadegeshin et al. (2019) identified privacy, cyber security, and trust-related problems as emerging when SMEs lack the technical knowledge to protect their digital systems. The interaction between skills and infrastructure creates a vicious cycle, where a lack of skills inhibits the exploitation of available infrastructure, and poor infrastructure discourages skills acquisition.

3 Technology Sophistication Gap and The Strategic Implications

The analysis in Figure 3 indicates a significant gap between technological potential and actual use, with implications for Nigeria's economic competitiveness. The disparity between the actual implementation of AI (15 percent) and its potential (50 percent), as reported by Abdulhamid and Abubakar (2024), is not merely an adoption delay but a strategic vulnerability in an increasingly AI-driven global economy. The gap in Mobile BI utilisation (18% current vs. 35% potential) is notable, as Adeyelure et al. (2016) suggested that even solutions designed for less sophisticated settings face adoption challenges. This observation challenges the assumption that technological suitability alone leads to higher adoption rates. The persistence of this gap suggests that without adjustments to organisational preparedness and support ecosystems, technical suitability is insufficient.

The gap in data analytics abilities (22% current vs. 40% potential) is concerning, particularly when combined with the low usage of social media analytics (12% vs. 30% potential). Although Orji et al. (2022) demonstrated the use of Twitter sentiment analysis in business intelligence, the penetration of social media analytics remains low. This represents a missed opportunity for SMEs to leverage widely available data for competitive advantage, especially

given high social media penetration in Nigeria. The gap between current and potential usage of cloud solutions (20% current and 42% potential) runs counter to expectations that cloud computing would lower barriers for SMEs. This suggests that organisational and cultural variables significantly influence technology adoption decisions beyond technical accessibility. This inconsistency indicates that conventional models of cloud adoption may not align with the decision-making habits and constraints of SMEs.

4 Research Evolution and the Longitudinal Data Deficit

The temporal distribution of research (Figure 4) shows a concerning concentration of activity in recent years, with a lack of longitudinal validation of earlier findings. The significant momentum in AI-oriented research (2021-2024) is a positive sign of focus on newer technologies but may also indicate a tendency toward technological optimism, lacking a long-term empirical foundation. The foundational conceptual work by researchers such as Ifinedo (2006) and Ekong et al. (2012) established critical theoretical frameworks like the TOE, which continue to influence current research. The shortage of longitudinal studies tracking SMEs from earlier research means a lack of vital information about the long-term trajectory of EBI adoption. This is a crucial shortcoming, as it is unclear whether issues identified by early studies have been resolved or transformed. The peak in digital transformation research (2019-2020) coincided with global digital acceleration trends but may reflect temporary flux rather than permanent transformational patterns. The lack of longitudinal data before and after this period makes it difficult to distinguish between structural and temporary changes.

The current focus on AI and new analytics, while aligned with global trends, may be premature given the persistent basic adoption barriers. The disconnect between optimism regarding AI potential and the persistent infrastructure and skills gaps can lead to a misalignment between research priorities and implementation reality.

5 Implementation Quality as the Critical Success Determinant

The correlation analysis in Figure 5 highlights that implementation quality is a primary determinant of EBI project success. The stark performance difference based on implementation quality confirms the risks of poor planning, as noted by Nduji et al. (2025), and underscores the benefits of high-quality implementation, as shown by Oluwasegun et al. (2024) and Okpara et al. (2024). The finding that poor implementation yields only 15-25% performance improvement, while high-quality implementation can achieve 72-85%, suggests that the implementation approach may be more significant than the technology choice itself. This challenges technologically deterministic views of EBI promotion and suggests that implementation facilitation could be more impactful than merely enhancing access to technology.

The medium implementation quality category, reflected in studies like Ejeh and Omede (2021), which showed performance improvements of 42-55%, indicates that partial implementation may be a feasible option for resource-constrained SMEs. This intermediate category implies the potential for gradual implementation schemes that can evolve over time. The cases where poor implementation led to performance deterioration, as in the assessment of E-Payment Administration (2023), highlight the risk that ineffective EBI initiatives can create long-

term resistance to digital transformation. This underscores the critical role of implementation quality in achieving sector-wide digital transformation.

6 Geographic and Sectoral Representation Challenges

The coverage biases demonstrated in Figure 6 indicate a deficiency in the generalizability of existing research. The 65 percent urban concentration, particularly in Lagos and Southwest Nigeria, creates a blind spot regarding the majority of Nigerian SMEs operating in different contexts with unique constraints and opportunities. The sectoral concentration on consumer goods and large SMEs, as seen in Okpara et al. (2024) and Romanus et al. (2023), constitutes a sampling bias that limits understanding of EBI use across Nigeria's diverse economic sectors. This concentration potentially leads to systematic neglect of sectors with different technology requirements and adoption patterns. The preference for larger SMEs (40% of studies) does not align with the definitional focus on small and medium enterprises, meaning much of the literature may reflect mid-market firm experiences rather than those of true SMEs. This bias has relevant implications for policy guidance and intervention design, as resource levels and organisational capabilities differ significantly across SME categories.

The methodological bias toward traditional approaches (35 percent focus) suggests the field may lack innovative research methods better suited to investigating technology adoption in resource-constrained settings. The underrepresentation of rural settings, small businesses, and heterogeneous sectors means the existing body of knowledge may fail to inform inclusive digital transformation policies. The issue of geographic concentration is particularly severe considering the specific issues of women-owned SMEs noted by Erumi-Esin and Heeks (2015), meaning the impact of geographic factors on such enterprises is also inadequately captured. This interconnection of boundaries implies that effective intervention strategies may need to be more nuanced than current studies suggest. These representation issues undermine the external validity of many research findings and indicate that effective EBI promotion may require more context-specific strategies than the current literature indicates. The under-representation of diverse SME situations may explain why generalized policy recommendations often fail in practice.

Conclusion

This synthesis of 50 studies demonstrates a significant gap between theoretical potential and the actual state of e-business intelligence adoption by Nigerian SMEs. Although research indicates positive effects on decision making, operational efficiency and competitive advantage, 60 percent of studies indicate low-level adoption, suggesting systemic problems rather than isolated implementation issues (Fabian et al., 2024; Oluwasegun et al., 2024; Okpara et al., 2024). The discussion reveals that essential obstacles identified in early studies remain unresolved, including infrastructural gaps, limited funds, and skills shortages, which still impede improvement despite technical advancements and policy efforts. The significant potential of AI and advanced analytics (Abdulhamid and Abubakar, 2024; Muktar et al., 2024) is countered by a large gap between theoretical prospects and real-life exploitation across all technology levels. Critically, this review shows that implementation quality is a more critical determinant of success than technological sophistication, with poor implementation potentially negatively affecting SME

performance. The generalizability of findings is constrained by an over-representation of urban, larger SMEs, while the lack of longitudinal data limits understanding of long-term effects. Future efforts should focus on developing context-specific frameworks, implementing intensive policy interventions, and addressing infrastructure and capacity building to realise the potential of e-business intelligence for the sustainable growth of Nigerian SMEs.

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