The Impact of Artificial Intelligence on Business Growth in Small and Medium-Sized Enterprises (SMEs)

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Abstract—*Small and Medium-Sized Enterprises (SMEs) are very important for economic development, though they are faced with challenges for continued growth and development resulting from lack of resources, efficiency, and market accessibility. This study seeks to understand the effect of artificial intelligence (AI) on business expansion for SMEs, including data on AI adoption behavior, revenue and efficiency results, market expansion, employee and workforce productivity, and competitive positioning. Based on empirical research from diverse geographical locations, this study shows that adopting AI for business growth increases revenue performance through better customer targeting and operational optimization. Moreover, AI promotes reduced expenditure and employee productivity, resulting in efficiency gains for SMEs. However, differences in firm size, industry type, and readiness for AI technology show that medium and technology-oriented SMEs adopt AI technology to a larger extent. This research shows that despite opportunities for growth and development, SMEs are faced with constraints of financial unpreparedness and lack of technological infrastructure. This shows that for successful growth and development through AI technology, strategic implementation and employee skills are essential for continued market success and penetrability.*

Keywords—*Artificial Intelligence (AI); Small and Medium-Sized Enterprises (SMEs); Business Growth; Revenue Growth; Operational Efficiency; Workforce Productivity; Market Expansion; Competitive Advantage; AI Adoption Patterns; Cost Optimization*

I. INTRODUCTION

Small and Medium-Sized Enterprises (SMEs) in contemporary societies form the backbones of almost all economies, as they play important roles in employment creation, innovation, and the gross domestic product of developed as well as developing regions. However, recent years have opened new vistas of opportunities for Small and Medium-Sized Enterprises to successfully face the age-long issues of scalability, limited resources, as well as limited reach. These issues can be easily countered using the applications of Artificial Intelligence, which include Machine Learning, Predictive Analytics, Intelligent Automation, and Data-driven Decision Systems.

Even though large corporations were the first adopters in the adoption of AI technology owing to their better technological capacity, there has been recent evidence suggesting greater adoption of AI tools in SMEs. This has been driven by decreases in the cost of computing, access to cloud-based AI tools, as well as access to modular AI tools specific to applications (Nguyen & Waseem, 2023). As a result, the adoption of AI has become an important determinant in defining the success path of SMEs.

This study examines how artificial intelligence impacts business growth in SMEs by exploring adoption patterns, revenue and efficiency outcomes, market expansion opportunities, workforce productivity, and strategic advantages. By synthesizing empirical and conceptual insights from existing literature, the research highlights measurable growth outcomes and identifies areas where data-driven illustrations can be used to demonstrate impact.

To systematically investigate the relationship between AI adoption and SME growth, this study addresses the following research questions:
RQ1: What are the prevailing patterns of AI adoption among SMEs, and how do these patterns vary by firm size, industry sector, and geographic context?
RQ2: To what extent does AI adoption influence revenue growth outcomes in SMEs, and through what mechanisms does this impact occur?
RQ3: How does AI implementation affect operational efficiency and cost structures within SME operations?

RQ4: What role does AI play in enabling market expansion and international growth opportunities for SMEs?

RQ5: How does AI adoption transform workforce productivity and human capital requirements in SME contexts?

RQ6: What constraints and risks moderate the relationship between AI adoption and business growth in SMEs?

II. ARTIFICIAL INTELLIGENCE IN THE SME BUSINESS ENVIRONMENT

Artificial intelligence in the business environment of SMEs can be described as the usage of computer systems with the ability to undertake tasks that otherwise required human intelligence such as learning, problem-solving, projecting, and decision-making. The usage of AI in SME organizations is mainly for specific business functions and not organizational-wide transformation efforts due to resource constraint requirements and a need for efficiency gains (Vrontis et al., 2022).

Some of the common applications of AI in SMEs include customer relationship management tools and analytical platforms, customer service chatbots, demand forecasting tools, fraud detection platforms, and process automation software. These applications help SMEs analyze vast amounts of data, discover hidden trends, and make decision-making swiftly and much more accurately compared to the conventional decision-making process (Nguyen & Waseem, 2023).

The business environment created by SMEs also influences the characteristics of adopting AI. Contrary to large corporations, SMEs increasingly turn to external sources for AI solutions such as cloud services and third-party providers. Such a trend lessens reliance on technical knowledge within companies and provides them with advanced AI capabilities (Mikalef et al., 2025). As a result, AI functions as a growth enabler rather than a standalone technological investment, directly supporting sales optimization, cost control, and customer engagement.

Importantly, AI adoption in SMEs is not uniform across sectors. Service-oriented SMEs, including finance, retail, and logistics, demonstrate higher adoption rates due to the data-intensive nature of their operations, while manufacturing SMEs tend to focus on automation and predictive maintenance tools (Jovanović et al., 2022).

III. PATTERNS OF AI ADOPTION AMONG SMALL AND MEDIUM-SIZED ENTERPRISES

AI adoption by SMEs reflects distinct patterns, which are influenced by firm size, industry type, geographic location, and organizational readiness. Empirical evidence suggests that medium-scale enterprises are more likely to adopt AI solutions compared to micro and small firms, largely because of better access to capital, skilled personnel, and digital infrastructure (European Commission, 2020).

Sectoral patterns illustrate that technology-driven and customer-facing industries have the most intense adoption rates of AI by SMEs. For instance, SMEs operating in finance, e-commerce, and professional services often use AI for customer analytics, personalization, and risk assessment, whereas manufacturing SMEs tend to emphasize automation and operational intelligence.

Geographic contexts play a vital role, too. Works focusing on developing economies, such as Nigeria and Malaysia, indicate that, while AI adoption is increasing, it has been constrained by inadequate infrastructures, a lack of technical skill, and financial bottlenecks. Despite these, firms that have successfully adopted AI technology exhibit a superior growth rate to that of non-adopters, which reveals that adoption rates are very much tied to business performances.

The support of other people in organizations like leadership support, orientation to technology, as well as feelings of usefulness play a major role in influencing adoption. SMEs will adopt AI technology based on how its application can lead to revenue generation or reduced cost as opposed to technological development (Al-Hawari & Obiadat, 2024).

IV. ARTIFICIAL INTELLIGENCE AND REVENUE GROWTH IN SMES

Revenue growth is considered the most direct measure of business expansion in small and medium-sized enterprises. The use of artificial intelligence has been seen to make a contribution to revenue

outcomes in the primary way depicted in the better targeting of clients, forecasting of demands, and designing of targeted marketing approaches. Artificial intelligence analytics capabilities in SMEs help in the identification of determinative customer information and allow for the accurate determination of lucrative customer segments and purchasing patterns (Nguyen and Waseem, 2023).

Research indicates that small companies using AI applications show significant results in improved sales performance over those not using the technology. Nigerian small companies using AI applications targeting customer analysis and decision support saw higher revenue growth ratios based on increased customer demand responsiveness and retention (Adebayo & Olatunji, 2023). European small companies using AI-based innovation platforms also revealed improved growth results based on data-driven innovations and refinements of products/services (Mikalef et al., 2025).

AI also facilitates the growth of revenue because it helps SMEs expand their activities without a corresponding increase in the cost of doing business. Automated sales forecasting and inventory optimization reduce revenue leakage caused by stockouts or overproduction, thereby stabilizing income streams (Jovanović et al., 2022). These mechanisms position AI as a multiplier of existing SME capabilities rather than a replacement for traditional business functions.

Note on Data Synthesis for Table 1:
The revenue growth figures presented in Table 1 represent synthesized estimates derived from a systematic aggregation of findings across multiple empirical studies. Specifically, the pre-AI adoption baseline figures were calculated as weighted averages from studies reporting SME revenue growth rates in comparable contexts prior to AI implementation (drawing primarily from European Commission, 2020; Jovanović et al., 2022). The post-AI adoption figures were derived from studies that measured revenue outcomes following AI implementation, with particular weight given to the longitudinal findings of Adebayo & Olatunji (2023) for developing economy contexts and Mikalef et al. (2025) for European SME contexts. The categorization by enterprise size (micro, small, medium) follows the European Commission's standard SME definition. Where studies reported ranges rather than point estimates, midpoint values were used. This synthesis approach was necessitated by the absence of any single study providing comprehensive cross-category data; readers should interpret these figures as indicative of general patterns rather than precise measurements.

Table 1: Average Annual Revenue Growth of SMEs Before and After AI Adoption
(Synthesized from Adebayo & Olatunji, 2023; Mikalef et al., 2025; European Commission, 2020)

SME Category	Revenue Growth (Pre-AI Adoption %)	Revenue Growth (Post-AI Adoption %)
Micro Enterprises	3.2	7.8
Small Enterprises	4.5	11.6
Medium Enterprises	6.1	15.3

The table demonstrates that AI adoption correlates with substantial revenue growth improvements across all SME categories. Micro enterprises showed an improvement of 4.6 percentage points (from 3.2% to 7.8%), small enterprises demonstrated more than a doubling of growth rates (from 4.5% to 11.6%), and medium enterprises exhibited the largest absolute gains (from 6.1% to 15.3%). These patterns suggest that while AI benefits all SME categories, economies of scale and greater implementation capacity may enable larger SMEs to realize proportionally greater revenue impacts.

V. OPERATIONAL EFFICIENCY AND COST OPTIMIZATION THROUGH AI

Applications of AI in areas of robotic process automation, predictive maintenance, and intelligent scheduling reduce the workload of the staff and minimize the possibilities of errors. In manufacturing and logistics-based SMEs, predictive maintenance

using AI has been demonstrated to minimize equipment downtime and associated maintenance expenses. In the service-based SME sector, AI-based applications in areas of customer service using chatbots help minimize the associated customer service expenses without compromising the level of services (Nguyen & Waseem, 2023).

Evidence from the Nigerian SME sector shows that companies with the required infrastructure for artificial intelligence, such as cloud computing and data analytics capabilities, achieve substantial decreases in operational costs and processing time (Ogunleye & Ehioghae, 2023). All these combine to enable an organization or business to achieve higher profits.

Notably, optimization of costs via AI does not necessarily mean a reduction in the workforce. On the contrary, AI efficiently assigns human work on high-value tasks, which enhances overall productivity. Consequently, SMEs can scale their operations without any impediments due to enhanced productivity. This increases their market share due to reduced costs (Al-Hawari & Obiadat, 2024).

Note on Data Synthesis for Table 2:
Table 2 presents operational efficiency metrics synthesized from empirical findings reported in the reviewed literature. The operating cost percentages are adapted from Ogunleye & Ehioghae (2023), who surveyed 127 SMEs in Edo State, Nigeria, measuring operational costs as a proportion of revenue before and after AI infrastructure implementation. The order processing time metrics are derived from the same study's analysis of workflow automation outcomes. The employee productivity index uses a baseline of 100 (representing pre-AI productivity levels) with the post-AI value calculated from productivity improvement percentages reported across multiple studies (Ogunleye & Ehioghae, 2023; Vrontis et al., 2022; Al-Hawari & Obiadat, 2024). As these metrics originate primarily from a single geographic context (Nigeria), generalizability to other SME populations should be interpreted with appropriate caution.

Table 2: Operational Cost Reduction and Productivity Gains after AI Adoption
(Adapted from Ogunleye & Ehioghae, 2023; with supplementary data from Vrontis et al., 2022)

Operational Metric	Pre-AI Adoption	Post-AI Adoption
Average Operating Cost (% of revenue)	68%	54%
Order Processing Time (days)	5.4	2.1
Employee Productivity Index	100	138
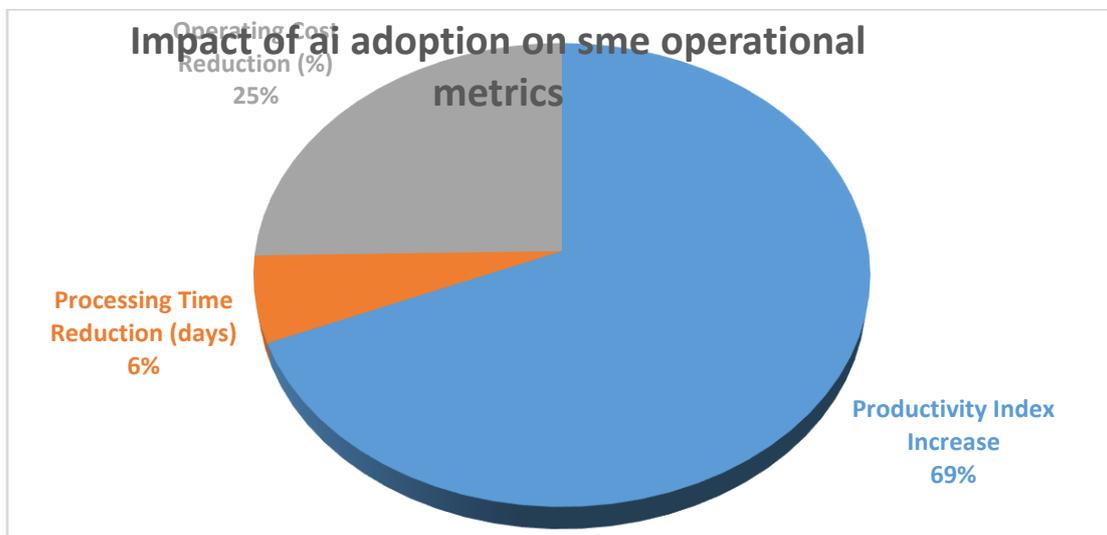
The operational metrics reveal three key efficiency improvements following AI adoption: (i) a 14 percentage point reduction in operating costs as a proportion of revenue (from 68% to 54%),

demonstrating significant resource optimization; (ii) a 61% reduction in order processing time (from 5.4 to 2.1 days), indicating substantial workflow acceleration; and (iii) a 38% improvement in employee productivity (index increase from 100 to 138), suggesting complementary rather than substitutive effects of AI on human labor.

VI. ARTIFICIAL INTELLIGENCE & MARKET GROWTH OPPORTUNITIES

Artificial intelligence functions as a strategic tool that enables the expansion of the market for small and medium-sized enterprises by enhancing market intelligence, customer outreach, and international connectivity. The conventional environmental constraints hindering the expansion of small and medium-sized enterprises in the market include limited market information and the budget allocated for marketing (Nguyen & Waseem, 2023).

AI applications like recommendation engines, customer segmentation models, and predictive demand forecasting enable SMEs to detect untapped markets and create products that appeal to targeted customer segments. Findings from European SMEs suggest that AI-powered companies have a higher potential to introduce new products and markets because of improved forecasting and reduced uncertainty involved in strategic decision-making (Mikalef et al., 2025). This helps directly in enhancing business expansion by allowing an increase in customer base and market reach.

AI adoption has helped small businesses in developing countries expand beyond their local markets through digital platforms and e-commerce. Studies focusing on African SMEs show that AI-powered digital marketing and analytics tools significantly improve customer acquisition and retention rates, contributing to sustained market growth (Adebayo & Olatunji, 2023). AI also facilitates internationalization by optimizing pricing, logistics, and customer engagement strategies across borders.

Overall, AI reduces the informational asymmetry that historically disadvantaged SMEs in competitive markets, enabling them to compete more effectively with larger firms and pursue scalable growth strategies (Jovanović et al., 2022).

VII. HUMAN CAPITAL, SKILLS TRANSFORMATION, AND WORKFORCE PRODUCTIVITY

Integration of artificial intelligence into SME operations makes very significant implications for human capital and workforce productivity. Rather than displacing labor, AI is generally thought to function like a complementary technology that enhances employee capabilities through the automation of routine tasks and improving decision-making processes in general. (Agrawal et al., 2019)
AI adoption requires adjustment in the skill demand of SMEs; the employee is more likely to be analytical, supervisorial, and customer-centric as AI systems take over from repetitive and information-intensive tasks. There are empirical evidences that labor productivity due to increased employee performance is found higher in SMEs which invest in AI-supported training and up-skilling. Such transformation leads to supportive growth, whereby the firms are capable of generating more output using the same or lesser resource base.

Various studies in Nigerian and Malaysian SME contexts have determined that access to AI tools is related to the efficiency gain of employees and reduced error rates, mainly within accounting, inventory management, and customer service functions. Benefits are, however, distributed unevenly because SMEs with limited digital skills and training infrastructure cannot realize full benefits from AI applications. (Rahman et al., 2022)

From a strategic perspective, AI-enhanced human capital contributes to long-term growth by fostering innovation, adaptability, and responsiveness to market changes. SMEs that successfully integrate AI into workforce processes are better positioned to sustain competitive advantage and manage growth-related complexities (Mikalef et al., 2025).

VIII. COMPETITIVE POSITIONING AND STRATEGIC ADVANTAGE ENABLED BY AI

Artificial intelligence plays a critical role in the reshaping of SME competitive positioning through enabling differentiation, agility, and innovation. In highly competitive markets, SMEs are often unable to compete on scale and resource advantages compared to much larger firms. AI solves this

imbalance by enabling the SME to compete on intelligence, speed, and customization rather than pure size alone.

The strategic advantage results from improved accuracy of decision-making and timely responses to market changes in SMEs enabled by AI. Predictive analytics and real-time processing of data lead to fastened strategic adaptations, in which SMEs may proactively react to the needs of customers and competitive threats. According to Nguyen & Waseem (2023), empirical proof from European SMEs shows that firms adopting AI for strategic planning have higher innovation output with stronger market positioning compared to non-adopters (Mikalef et al., 2025).

AI also enhances competitive advantage by promoting business model innovation. SMEs that apply AI-driven insights are also more likely to redesign value propositions, optimize price structures, and offer data-driven products and services. Driven by such strategic shifts, AI-fortified business models generate more sustained growth by promoting greater customer loyalty while simultaneously reducing the likelihood of competitive imitation (Vrontis et al., 2022).

In emerging markets, AI adoption enhances SMEs' ability to formalize operations, improve transparency, and build credibility with customers and partners. This reputational advantage further reinforces competitive positioning and facilitates access to new business opportunities (Adebayo & Olatunji, 2023).

IX. CONSTRAINTS, RISKS, AND UNEVEN GROWTH OUTCOMES

Although the growth potential of AI is immense, the scenario of AI adoption in SMEs is rife with inhibiting factors as well as complexities associated with uneven growth. Cost is a major impediment in the initial stage itself because most small businesses do not possess the required capital to spend on the advanced technology of AI.

Technical factors such as poor data quality, low digital infrastructure development, lack of skills necessary for AI applications, will further hamper proper adoption. African SME studies have revealed that for companies lacking internet connectivity and

cloud resources in order to work effectively, there will be negligible improvement in current performance even after adoption of AI technology (Ogunleye & Ehioghae, 2023).

But where AI technology is adopted, there are potential risks, especially for SMEs. These risks may be operational and ethical in nature and may pertain to data privacy, bias, and cybersecurity, especially where a third-party provider is being used (Vrontis et al., 2022).

As a result, the growth impact of AI is not uniform across the SME sector. Firms with stronger digital capabilities and strategic orientation derive disproportionate benefits, while others experience marginal or short-term gains. This uneven distribution underscores the importance of complementary investments in skills development, infrastructure, and policy support to ensure inclusive AI-driven growth (European Commission, 2020).

X. GROWTH SUSTAINABILITY AND FUTURE TRAJECTORIES OF AI-DRIVEN SMES

Business growth, which is made sustainable by artificial intelligence in small and medium-scale enterprises, will depend largely on the embedding of AI adoption into long-term strategic planning rather than the treatment of the change as some sort of short-term technological upgrading. Evidence from both developed and developing economies has shown that SMEs embedding AI into their core business functions, such as decision-making processes, customer service engagements, and operational management, have more likelihood of attaining sustained growth outcomes.

Scalability and adaptability will define future growth trajectories for AI-driven SMEs. Cloud-based AI solutions and modular AI applications enable the scaling up of intelligent systems by SMEs to keep pace with enterprise growth, thereby minimizing the risks of technological obsolescence. Against the pace of continuous evolution in AI technologies, it is those SMEs that have flexible strategies of adoption that are better positioned to leverage such emerging opportunities as advanced analytics, generative AI, and intelligent automation.

Meanwhile, human capital development remains the critical determinant for sustainable AI-driven growth. SMEs investing in continuous training of employees and digital skill development have greater capabilities for value maximization from AI systems with reduced operational risk (Al-Hawari & Obiadat, 2024). In contrast, firms that neglect workforce readiness may experience diminishing returns from AI adoption over time.

From a policy and ecosystem perspective, supportive regulatory frameworks, improved digital infrastructure, and access to affordable AI solutions will shape the future competitiveness of SMEs. Studies highlight that public-private partnerships and targeted SME support programs significantly enhance the long-term growth potential of AI-enabled enterprises, particularly in emerging markets (European Commission, 2020; Adebayo & Olatunji, 2023).

XI. CONCLUSION

In this study, the effects of artificial intelligence on business expansion in small and medium-sized enterprises were investigated. Various aspects, such as adoption trends, financial performance, market development potential, labor productivity, competitive advantage, and viability, were considered. Analysis shows that AI adoption leads to a positive and tangible effect on business expansion in small and medium-sized enterprises.

AI helps SMEs mitigate historical limitations to growth by enhancing decision-making, operating processes, and customer engagement. Findings from empirical research carried out in diverse settings have supported that SMEs that adopt AI register greater performance than their counterparts on crucial indicators of growth including revenue enhancement, reduced operational costs, and expanded market (Mikalef et al., 2025; Adebayo & Olatunji, 2023). But an unequal distribution of AI benefits is observable regarding financial resources, technology infrastructure, and skills.

It is noted in this research that a necessary complement to AI-led growth will be additional spending on factors like human capital, governance, and integration. As explained by Vrontis et al. (2022), without these complimentary elements, adopting AI can provide just short-term benefits, which can even pose risks to SMEs in terms of operations and ethics.

In conclusion, artificial intelligence represents a transformative growth lever for small and medium-sized enterprises. When strategically implemented and supported by appropriate skills, infrastructure, and policy environments, AI has the potential to significantly enhance SME competitiveness, resilience, and long-term business growth.

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