

Application of Automated Machine Learning and Robotic Process Automation for Enhancing Business Efficiency Among Small and Medium Scale Enterprises

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Abstract: *The study examined extent of application of Automated Machine Learning (AML) and Robotic Process Automation (RPA) in enhancing the performance of Small and Medium Scale Enterprises (SMEs) in Ebonyi State, Nigeria. The study was motivated by the growing importance of the application of Artificial Intelligence (AI) technologies in improving business efficiency, decision-making, and competitiveness. A descriptive survey research design was adopted. The population comprised 15,000 registered SMEs in Ebonyi State, from which a sample of 389 SME owners was determined using the Taro Yamane formula. Data were collected using a structured questionnaire. The instrument was validated by experts, while cluster reliability coefficients of 0.80 and 0.84 were obtained using Cronbach Alpha. Out of the 389 copies of the questionnaire administered, 375 were duly completed and returned. Data was analyzed using mean and standard deviation to answer the research questions and one-way ANOVA was used to test the hypotheses at 0.05 level of significance. The findings revealed that Automated Machine Learning was moderately applied in enhancing SME performance. SMEs moderately utilized AML for decision-making, operational efficiency, sales forecasting, customer engagement, and revenue growth. Similarly, Robotic Process Automation was moderately applied, with a cluster mean of 2.59, indicating its use in automating routine tasks, improving efficiency, reducing errors, and lowering operational costs. The study further found that years of business experience did not significantly influence SME owners' ratings on the application of AML and RPA, as all ANOVA p-values exceeded the 0.05 level of significance. It was concluded that although AML and RPA contribute to improved operational efficiency and business performance, their adoption among SMEs in Ebonyi State remains moderate due to financial, technical and infrastructural constraints. It was recommended that increased digital capacity building, improved access to affordable AI solutions, and supportive government policies should be provided to encourage wider adoption of AI automation technologies among SMEs.*

Keywords: artificial intelligence, automated machine learning, robotic process automation, SME performance, digital transformation, operational efficiency, Ebonyi State.

INTRODUCTION

Small and Medium Scale Enterprises (SMEs) remain fundamental drivers of economic development across developing economies because of their contribution to employment generation, innovation, income distribution and poverty reduction. In Nigeria, SMEs represent a significant proportion of business activities and provide livelihood opportunities for millions of citizens. Beyond their economic contributions, SMEs support local production, stimulate entrepreneurship and enhance regional development.

However, despite their importance, many SMEs continue to experience operational challenges associated with low productivity, inefficient business processes, inappropriate decision-making systems and limited competitiveness in digital markets (National Bureau of Statistics [NBS], 2021; World Bank, 2022). The emergence of Artificial Intelligence (AI) has created new possibilities for addressing these challenges by enabling businesses to automate processes, analyze large volumes of data, improve decision-making and deliver personalized services. Artificial Intelligence refers to the capability of computer-based systems to perform tasks that traditionally require human intelligence, including learning, reasoning, prediction, problem-solving and decision-making (Dwivedi et al., 2021). Unlike conventional technologies that mainly support information processing, AI systems can analyze patterns, adapt to changing conditions, and provide intelligent recommendations that support enhanced organizational performance.

Within business environments, AI automation has become increasingly important because it allows organizations to replace repetitive manual processes with intelligent digital systems. AI automation involves the use of AI-powered technologies to execute business activities with minimal human intervention. These technologies include automated machine learning (AutoML), Robotic Process Automation (RPA), natural language processing, predictive analytics, recommendation systems, and intelligent virtual assistants (Davenport & Mittal, 2022). For SMEs, AI automation provides opportunities to reduce operational costs, improve accuracy, optimize resource allocation and enhance customer relationships.

Automated Machine Learning (AutoML) represents one of the emerging AI applications that enable organizations to develop and deploy machine learning models with reduced dependence on highly specialized data scientists. Automated machine learning refers to the process by which algorithms and statistical models are employed to allow machines to learn from data without being explicitly programmed for every task (Mahesh, 2020). AutoML automates various stages of machine learning processes, including data preparation, model selection, and algorithm optimization and performance evaluation. For SMEs with limited technical expertise, AutoML provides a practical approach to utilizing predictive insights for business decisions such as sales forecasting, demand prediction, customer analysis and resource planning (Khan et al., 2023). Through AutoML applications, SMEs can identify market trends, anticipate customer behaviour and make evidence-based decisions that improve business outcomes.

AutoML also supports evidence-based decision-making by converting raw business data into meaningful insights. According to Kotsiantis, et al. (2021), automated machine learning improves accessibility to advanced analytics by enabling organizations to develop predictive models without extensive programming knowledge. This is particularly beneficial to SMEs that may lack dedicated data analysts or information technology specialists

The relevance of AI automation to SMEs is increasingly recognized because small businesses often operate under conditions of limited financial resources, human capital constraints, and competitive pressure. AI-driven solutions allow SMEs to automate routine activities, improve accuracy, and allocate human resources to more strategic tasks. For example, AI-powered systems can automate financial record processing, analyze customer behaviour, forecast demand, and provide recommendations for business decisions (Mikalef & Gupta, 2021).

Similarly, Robotic Process Automation (RPA) has gained attention as an important AI-driven automation technology that improves business efficiency by automating repetitive and rule-based activities. Robotic Process Automation (RPA) is an AI application that helps automate business processes using a well-defined rule engine. The RPA refers to the use of software robots, or "bots," to automate repetitive and rule-based tasks that were traditionally performed by humans (Durão & dos Reis, 2024). RPA involves the use of software robots to perform routine organizational tasks such as financial transactions, invoice processing, inventory monitoring, data entry, customer support and administrative reporting (Aguirre & Rodriguez, 2021). By reducing dependence on manual processes, RPA enables SMEs to improve operational speed, minimize errors and allow employees to focus on more strategic activities.

The primary objective of RPA is to improve operational efficiency by reducing manual efforts, minimizing errors, increasing processing speed and lowering operational costs. In SME environments, RPA can support accounting activities by automating transaction recording, invoice generation, payroll processing, and financial reporting. Similarly, SMEs can apply RPA in inventory management by automatically updating stock records, monitoring supply levels, and generating alerts when inventory requires replenishment

The relationship between AI automation and SME performance has attracted increasing scholarly attention due to the potential of intelligent technologies to transform business operations. SME performance is commonly measured through indicators such as productivity, profitability, operational efficiency, customer satisfaction, innovation capability and competitive advantage. AI automation contributes to SME performance by improving the speed and quality of decision-making. Through technologies such as AutoML, SMEs can analyze business data and generate predictive insights that support planning and strategic decisions. Similarly, RPA improves efficiency by reducing manual workload, minimizing errors, and streamlining business processes. According to Mikalef and Gupta (2021), organizations with strong AI capabilities achieve superior performance because AI enhances information processing capabilities and supports innovation.

Similarly, Enholm et al. (2022) observed that AI adoption improves organizational efficiency by enabling automation, personalization, and data-driven management.

For SMEs in developing economies such as Nigeria, AI automation provides opportunities to overcome traditional operational limitations. Automated systems can improve customer responsiveness through faster communication, enhance inventory management through accurate forecasting and reduce operational expenses through process automation. However, realizing these benefits requires appropriate investment in digital infrastructure, employee training, and organizational readiness

Recent studies indicate that AI automation contributes significantly to organizational efficiency and competitiveness. According to Mikalef and Gupta (2021), organizations with stronger AI capabilities achieve improved performance because AI enables better information processing, innovation, and strategic decision-making. Similarly, Enholm et al. (2022) reported that AI adoption enhances organizational productivity by improving process efficiency and supporting data-driven management practices. However, despite these advantages, SMEs in developing countries continue to experience difficulties in adopting AI technologies due to financial limitations, inadequate infrastructure, limited digital skills and uncertainty regarding technological benefits (OECD, 2021).

In Nigeria, the adoption of AI automation among SMEs remains relatively low compared with developed economies. Many small businesses still depend on traditional approaches to accounting, inventory management, customer relations and business planning. Manual operations often result in delayed decision-making, inaccurate records, inefficient resource utilization, and reduced competitiveness. Although some Nigerian SMEs have begun adopting digital platforms such as online payment systems, social media marketing, and cloud-based business applications, advanced AI automation tools such as AutoML and RPA remain underutilized (Adebayo & Ojo, 2023). The situation may be particularly true in Ebonyi State, where SMEs operate mainly within commerce, agriculture-related businesses, manufacturing, transportation and service sectors. These enterprises require efficient business processes and innovative approaches to compete effectively in local and regional markets. However, many SMEs in the state face challenges including limited access to advanced technologies, inadequate digital knowledge, financial constraints, and weak technological infrastructure. Consequently, many business operators continue to rely on manual systems for forecasting, accounting, inventory management, and customer engagement.

Although previous studies have examined technology adoption and digital transformation among SMEs, limited empirical attention has been given to specific AI automation technologies such as Automated Machine Learning and Robotic Process Automation within the context of Ebonyi State. This creates a knowledge gap regarding the extent to which SMEs apply AI automation tools and the extent to which such technologies contribute to improved business efficiency. Therefore, this study examines the application of automated machine learning and robotic process automation in enhancing the performance of small and medium scale enterprises in Ebonyi State. The study

provides empirical evidence on the level of AI automation adoption, its contribution to business efficiency and the barriers limiting effective implementation among SMEs.

Statement of the Problem

Small and medium scale enterprises (SMEs) contribute significantly to Nigeria's economic development through employment creation, innovation, and local economic growth. However, many SMEs continue to experience challenges such as low productivity, inefficient operations, poor decision-making, weak customer management, and limited competitiveness due to reliance on manual business processes. Artificial Intelligence (AI) automation offers opportunities to address these challenges through improved efficiency, cost reduction, and data-driven decision-making. Tools such as automated machine learning support forecasting, customer analysis, and strategic planning, while robotic process automation enhances efficiency by automating routine activities such as accounting, inventory management and administrative tasks.

Despite these benefits, AI adoption among SMEs remains limited due to high costs, inadequate digital skills, poor infrastructure and limited access to quality data. In Ebonyi State, many SMEs still operate using traditional methods, which may restrict their ability to optimize operations and compete in a digital economy. Therefore, this study seeks to determine the extent of application of automated machine learning and robotic process automation in enhancing the performance of small and medium scale enterprises in Ebonyi State.

Purpose of the Study

The main purpose of this study was to examine the application of AI automation tools in enhancing the performance of small and medium scale enterprises in Ebonyi State. Specifically, the study seeks to determine the extent of application of:

1. Automated machine learning in enhancing the performance of small and medium scale enterprises.
2. Robotic process automation in enhancing the performance of small and medium scale enterprises.

Research Questions

The following research questions guided the study:

1. To what extent is automated machine learning applied in enhancing the performance of small and medium scale enterprises?
2. To what extent is robotic process automation applied in enhancing the performance of small and medium scale enterprises?

Hypotheses

The following null hypotheses were formulated and tested at the 0.05 level of significance:

1. There is no significant difference in the mean ratings of SME owners on the extent of application of automated machine learning in enhancing the performance of small and medium scale enterprises based on years of business experience.
2. There is no significant difference in the mean ratings of SME owners on the extent of application of robotic process automation in enhancing the performance of small and medium scale enterprises based on years of business experience.

METHODOLOGY

The study adopted a descriptive survey research design. The study was conducted in Ebonyi State; Nigeria. The population of the study comprised 15,000 registered small and medium scale enterprises operating in Ebonyi State. The sample size of 389 owners of small and medium scale enterprises was used for the study which was determined using Taro Yamane formula. A proportionate stratified random sampling technique was used to ensure representation of different categories of SMEs. The instrument for data collection was a questionnaire developed by the researchers. The questionnaire was dully validated. It has a reliability coefficient of 0.84 determined using Cronbach alpha. Mean and standard deviation were used for finding answers to the research questions, while one-way Analysis of Variance (ANOVA) was used to test the null hypotheses at 0.05 level of significance respectively.

RESULTS

Research Question 1: To what extent is the application of automated machine learning enhancing the performance of small and medium scale enterprises?

Answer to the research question is presented in Table 1

Table 1: Mean ratings of SME owners on their Extent of Application of Automated Machine Learning in Enhancing Performance of Small and Medium Scale Enterprises. (N = 375)

S/No	Automated Machine Learning	Mean	SD	Decision
1.	Automated machine learning (AML) tools is relevance to business operations.	2.70	0.48	Moderately applied
2.	Our enterprise currently uses Automated machine learning-based tools to support decision-making.	2.71	0.48	Moderately applied
3.	Automated machine learning has been integrated into at least one aspect of our operations.	2.68	0.47	Moderately applied
4.	The use of Automated machine learning tools has improved operational efficiency in our business.	2.65	0.48	Moderately applied
5.	Automated Machine learning has helped us reduce costs associated with manual business processes.	2.67	0.51	Moderately applied
6.	Automated Machine Learning has enhanced the accuracy of our business sales forecasting	2.64	0.50	Moderately applied
7.	Since adopting Automated machine learning tools, our customer engagement and satisfaction have improved.	2.69	0.47	Moderately applied
8.	The adoption of Automated machine learning has contributed to the growth of our business revenue.	2.67	0.51	Moderately applied
9.	Poor usage of automated machine learning tools as a result of high cost.	2.66	0.47	Moderately applied
10.	Our business lacks the technical skills or personnel required to operate Automated machine learning systems.	2.66	0.50	Moderately applied
11.	Limited access to reliable data hinders our ability to use Automated machine learning effectively.	2.70	0.53	Moderately applied
12.	We are willing to expand the use of Automated machine learning in our business in the near future.	2.69	0.46	Moderately applied
Cluster Mean		2.68		Moderately applied

From Table 1, the overall mean of 2.68 indicates moderate application of automated machine learning (AML). All items had mean scores ranging from 2.64 to 2.71, showing SMEs moderately integrated AML into business decision-making, operational efficiency and revenue growth.

Research Question 2: To what extent is the application of robotic process automation enhancing the performance of small and medium scale enterprises? Answer to the research question is presented in Table 2

Table 2: Mean ratings of SME owners on their Extent of Application of Robotic Process Automation in Enhancing Performance of Small and Medium Scale Enterprises. (N = 375)

S/No	Robotic Process Automation	Mean	SD	Decision
1.	Automation software are used for routine tasks	2.73	0.53	Moderately applied
2.	We use automated software's to carry out our business functions such as accounting, inventory and customers services using RPA tools	2.51	0.58	Moderately applied
3.	We have used data or statistical tools (e.g., Excel, Power BI) to forecast sales.	2.51	0.63	Moderately applied
4.	We use RPA tools such as UiPath, Power Automate, to support our business operations.	2.56	0.63	Moderately applied
5.	RPA has improved the speed and efficiency of our business processes.	2.70	1.66	Moderately applied
6.	The use of RPA has reduced human error in our operations (e.g., data entry, invoicing).	2.65	0.53	Moderately applied
7.	Automation has helped us reduce the cost of labor and manual processes.	2.57	0.61	Moderately applied
8.	RPA tools have enabled us to scale operations without hiring additional staff.	2.57	0.62	Moderately applied
9.	The cost of implementing RPA tools is too high for our business.	2.66	0.49	Moderately applied
10.	The automation of routine customer interactions has improved customer satisfaction and response time.	2.55	0.58	Moderately applied
11.	Our business lacks the technical skills or personnel needed to implement RPA.	2.62	0.56	Moderately applied
12.	Poor internet makes RPA adoption difficult in our area.	2.43	0.59	Lowly applied
Cluster Mean		2.59		Moderately applied

The overall mean in Table 2 is 2.59, indicating moderate application of RPA. Eleven items ranged from 2.51 to 2.73, while only “Poor internet makes RPA adoption difficult” at (2.43). Moderate adoption of RPA is evident, with SDs mostly below 0.65, indicating reasonable consistency among SMEs.

Test of Hypotheses

Hypothesis 1

There is no significant difference in the mean ratings of SMEs owners on the extent of application of automated machine learning in enhancing performance of small and medium scale enterprises based on years of experience.

Table 3: Summary of ANOVA on the Extent of Application of Automated Machine Learning in Enhancing Performance of SMEs

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Decision
1. Between Groups	.567	2	.283	1.214	.298	Accept
Within Groups	86.777	372	.233			
Total	87.344	374				
2. Between Groups	.226	2	.113	.494	.611	Accept
Within Groups	85.091	372	.229			
Total	85.317	374				
3. Between Groups	.270	2	.135	.618	.540	Accept
Within Groups	81.330	372	.219			
Total	81.600	374				
4. Between Groups	.373	2	.186	.820	.441	Accept
Within Groups	84.561	372	.227			
Total	84.933	374				
5. Between Groups	.706	2	.353	1.341	.263	Accept
Within Groups	97.950	372	.263			
Total	98.656	374				
6. Between Groups	.864	2	.432	1.718	.181	Accept
Within Groups	93.536	372	.251			
Total	94.400	374				
7. Between Groups	.555	2	.277	1.285	.278	Accept
Within Groups	80.315	372	.216			
Total	80.869	374				
8. Between Groups	.431	2	.215	.815	.443	Accept
Within Groups	98.225	372	.264			
Total	98.656	374				
9. Between Groups	.657	2	.328	1.460	.233	Accept
Within Groups	83.653	372	.225			
Total	84.309	374				
10. Between Groups	.566	2	.283	1.152	.317	Accept
Within Groups	91.423	372	.246			
Total	91.989	374				
11. Between Groups	1.242	2	.621	2.263	.105	Accept
Within Groups	102.102	372	.274			
Total	103.344	374				
12. Between Groups	.824	2	.412	1.932	.146	Accept
Within Groups	79.294	372	.213			
Total	80.117	374				

Table 3 shows that at 372 degree of freedom, experience in business did not significantly influence the mean ratings of the respondents on the extent of application of automated machine learning in

enhancing performance of small and medium scale enterprises. *P-values* .298, .611, .540, .441, .263, .181, .278, .443, .233, .317, .105 and .146 are greater than the stipulated 0.05 level of significance ($P\text{-value} > \alpha\text{ level}$). Therefore, the null hypothesis of no significant difference was accepted.

Hypothesis 2: There is no significant difference in the mean ratings of SMEs owners on the extent of application of robotic process automation in enhancing performance of small and medium scale enterprises based on years of experience.

Table 4: Summary of ANOVA on the Extent of Application of Robotic Process Automation in Enhancing Performance of SMEs

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Decision
1. Between Groups	1.400	2	.700	2.531	.081	Accept
Within Groups	102.856	372	.276			
Total	104.256	374				
2. Between Groups	1.558	2	.779	2.334	.098	Accept
Within Groups	124.138	372	.334			
Total	125.696	374				
3. Between Groups	.543	2	.272	.677	.509	Accept
Within Groups	149.190	372	.401			
Total	149.733	374				
4. Between Groups	.386	2	.193	.492	.612	Accept
Within Groups	146.131	372	.393			
Total	146.517	374				
5. Between Groups	1.638	2	.819	.296	.744	Accept
Within Groups	1029.706	372	2.768			
Total	1031.344	374				
6. Between Groups	1.567	2	.784	2.850	.059	Accept
Within Groups	102.262	372	.275			
Total	103.829	374				
7. Between Groups	.490	2	.245	.653	.521	Accept
Within Groups	139.659	372	.375			
Total	140.149	374				
8. Between Groups	1.011	2	.506	1.337	.264	Accept
Within Groups	140.722	372	.378			
Total	141.733	374				
9. Between Groups	.543	2	.271	1.150	.318	Accept
Within Groups	87.767	372	.236			
Total	88.309	374				
10. Between Groups	.023	2	.011	.034	.967	Accept
Within Groups	124.713	372	.335			
Total	124.736	374				
11. Between Groups	.500	2	.250	.787	.456	Accept
Within Groups	118.204	372	.318			
Total	118.704	374				
12. Between Groups	.358	2	.179	.506	.603	Accept
Within Groups	131.519	372	.354			
Total	131.877	374				

Table 4 shows that at 372 degree of freedom, experience do not significantly influence the mean ratings of the respondents on the extent of application of robotic process automation in enhancing performance of small and medium scale enterprises. *P-values* .081, .098, .509, .612, .744, .059, .521, .264, .318, .967, .456 and .603 are greater than the stipulated 0.05 level of significance ($P\text{-value} > \alpha \text{ level}$). Therefore, the null hypothesis is accepted.

DISCUSSION

Application of Automated Machine learning in enhancing Performance of Small and Medium Scale Enterprises in Ebonyi State

The results of the study indicated that automated machine learning is moderately applied in enhancing the performance of SMEs in Ebonyi State. Automated machine learning tools enable SMEs to analyze business data, generate predictive insights, and support managerial decision-making without requiring extensive technical expertise in data science. Through AutoML, SMEs can automate analytical tasks such as sales forecasting, customer segmentation, and trend analysis. The moderate level of adoption observed in this study may be attributed to several factors including perceived complexity, cost of implementation, and limited data infrastructure among SMEs. Many small business owners lack adequate technical knowledge to fully utilize machine learning technologies. These findings support the observations of Vaijhal (2023), who noted that the adoption of AutoML in SMEs is often constrained by infrastructural limitations, lack of skilled personnel and insufficient financial resources. Similarly, Enejo, Ojabo and Simon (2024) reported that although machine learning technologies are gradually gaining acceptance among SMEs, their adoption remains relatively low due to skill gaps and inadequate technological infrastructure.

In addition, Bauer, van Dinther and Kiefer (2020) found that while machine learning technologies were increasingly being adopted by organizations globally, SMEs often struggled with their implementation compared to larger enterprises. This difficulty stems primarily from limited expertise in the application of machine learning technologies and insufficient financial capacity to invest in sophisticated technological systems. The relatively low standard deviation values (0.46–0.53) indicate a strong level of agreement among SME owners regarding the usefulness and applicability of automated machine learning tools. This consistency suggests that respondents generally perceived AutoML as a potentially valuable technology capable of improving operational efficiency and supporting data-driven decision-making. With many modern business software applications incorporating automated analytics features, SMEs are gradually gaining access to simplified machine learning tools that do not require advanced technical knowledge.

Furthermore, automated machine learning can significantly improve SME operational efficiency by automating analytical processes, optimizing resource allocation and enabling data-driven decision-making. These capabilities allow SMEs to compete more effectively in increasingly data-driven business environments. The test of the second hypothesis revealed no significant difference in the mean ratings of respondents based on years of business experience regarding the application of automated machine learning in enhancing SME performance. This finding suggests that the adoption of AutoML technologies is largely independent of managerial experience or the age of

the business. Instead, adoption appears to be influenced primarily by organizational technological readiness and access to digital infrastructure. This result contradicts the findings of Ndubuisi-Okolo, Eneh and Anyahara (2025) who reported that managerial experience significantly influenced the operational efficiency derived from AI technologies.

Application of Robotic Process Automation (RPA) in enhancing Performance of Small and Medium Scale Enterprises in Ebonyi State

The study further revealed that robotic process automation was moderately applied in enhancing SME performance in Ebonyi State. RPA involves the use of software robots to automate repetitive and rule-based business processes such as billing, inventory management, order processing and administrative record-keeping. Through automation, SMEs can reduce operational costs, minimize human errors, and improve service efficiency. The relatively low standard deviation values (0.49–0.63) indicate a high level of agreement among respondents regarding the usefulness of RPA tools. However, the higher variability observed in some advanced automation functions ($SD = 1.66$) suggests that only a limited number of technologically advanced SMEs have adopted sophisticated automation systems. This disparity indicates that the adoption of RPA technologies was strongly influenced by financial capability, availability of digital infrastructure and access to skilled IT personnel.

These findings support the studies of Bala, Hamza and Lawal (2024) and Erdmann and Sandkuhl (2023) who identified financial constraints, technological limitations and lack of technical expertise as major barriers to the adoption of robotic process automation among SMEs in developing economies. By automating routine business operations, RPA allows SME employees to focus on strategic tasks such as innovation, business development and customer relationship management, thereby improving overall organizational productivity. The results of the second hypothesis test revealed no significant difference in respondents' ratings based on years of experience regarding the use of robotic process automation in enhancing SME performance. This finding suggests that the adoption of RPA technologies is largely determined by financial resources and technological readiness rather than managerial experience. This observation aligns with the findings of Omengbeoji and Ofor (2024) who reported that SME adoption of automation technologies is influenced more by technological capability and investment capacity than by business longevity.

CONCLUSION

The findings revealed that both AML and RPA were moderately applied among SMEs, indicating that while awareness and partial adoption of AI automation tools existed, full integration into core business processes was still limited. Specifically, SMEs utilized AML for decision-making, forecasting, and customer-related analytics, while RPA is applied in routine operations such as accounting, inventory management, and administrative tasks. These technologies contributed positively to improved efficiency, reduced operational costs, and enhanced productivity. However,

the level of utilization remains constrained by factors such as inadequate digital skills, high cost of implementation, poor infrastructure, and limited access to reliable data systems. It was, therefore, concluded that AI automation was gradually influencing SME performance in Ebonyi State, but its potential was not yet fully realized due to structural and capacity-related limitations.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. SME operators should be trained on the use of AI automation tools such as AML and RPA through workshops, digital literacy programs and entrepreneurship development initiatives. This will improve technical competence and enhance adoption.
2. Government agencies such as SMEDAN and relevant ICT bodies should develop targeted policies that support SME digital transformation through subsidies, grants and tax incentives for AI adoption.
3. Efforts should be made to enhance internet connectivity and stable power supply in Ebonyi State, as these are critical enablers for the effective use of AI-based technologies.
4. Technology providers should design low-cost, user-friendly AI tools tailored to small business operations, particularly in areas such as accounting automation, sales forecasting and customer service.
5. SMEs should be encouraged to adopt structured data collection and management systems to support the effective use of AML and predictive automation tools.
6. Banks and financial institutions should integrate AI-based advisory and credit assessment tools to support SME growth and encourage digital adoption.

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