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Artificial Intelligence Adoption and Business Performance: Evidence from Small and Medium Enterprises in Emerging Markets

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Abstract

Given the seemingly widespread adoption of Artificial Intelligence (AI) by big businesses and its impact on their performance, this study investigated the performance implications of AI adoption, focusing on Generative AI and ChatBots on Customer Relationship Management (CRM) capability among Small and Medium Scale Enterprises (SMEs) in southeastern Nigeria. The study adopted a a survey research design, a structured questionnaire was distributed electronically to 371 digitally literate SME owners which constituted the sample size from a population of 11,231 SMEs across the five south-eastern states in Nigeria, with 310 valid responses analyzed using descriptive and inferential statistics, including regression analysis at a 5% level of significance. The findings revealed a notable gap between awareness and actual usage of AI tools. While SMEs demonstrate moderate awareness of Generative AI and ChatBots, practical application remains significantly low. However, the perception of their potential benefits, such as improved content creation, faster customer responses, and enhanced service delivery, is highly positive. Regression results confirmed that both Generative AI and ChatBot usage significantly and positively influence CRM capability, jointly accounting for 98.1% of the variance. The study concluded that despite low adoption rates, AI technologies hold strong potential for enhancing CRM among SMEs. To bridge the gap between awareness and usage, the study recommended increased capacity-building, subsidised access to AI tools, and integration of AI support into SME development policies. These measures can empower SMEs to leverage AI for sustained competitiveness and customer satisfaction in the digital economy.

Keywords: *Artificial Intelligence (AI), Customer Relationship Management (CRM), Generative AI, ChatBots, Small and Medium Scale Enterprises, Emerging Markets*

INTRODUCTION

Small and Medium Scale Enterprises (SMEs) are seen globally as being critical to economic growth and industrialisation around the world. SMEs relatively small in terms of personnel, assets, and sales, explaining the reason for the name, small-scale enterprises. Despite their small size, they play a crucial role in job creation, income generation, innovation, and Gross Domestic Product (GDP) of nations (Kumar, Pandey, Pujari & Arora, 2023), both in developed and emerging nations. By creating jobs and supporting innovation and creativity, SMEs greatly promote national and community-level economic development (Ebuka, Emmanuel & Idigo, 2023; Bandari, 2019). However, these SMEs sometimes struggle with things like insufficient access to finance, infrastructural deficiencies, and low technological adoption that hinder their development, competitiveness, and sustainability (Umetiti, Nwafor, Arachie & Ifeme, 2025). Many SME owners and workers, in particular, lack sufficient knowledge of digital technologies, which impairs their capacity to explore the advantages

of contemporary tools, including Artificial Intelligence (AI), especially in emerging nations like Nigeria.

Particularly with the arrival of the Fourth Industrial Revolution, the world today is undergoing fast technological development. Technological advancements are imperative for sustainable business growth and development (Nwabuike, Onodugo, Arachie, Nkwunonwo, 2020). The world is increasingly becoming more technologically inclined than ever before (Ebuka, Nzewi, Gerald & Ezinne, 2020), and AI is taking centre stage. AI is an inventive discovery with the power to change how companies are operated (Xiong, Xia & Wang, 2020; Schwab, 2017). By mimicking human intellect and learning, AI technologies let systems examine enormous data sets, produce insights, and make judgments with extraordinary speed and accuracy (Shankar, 2018; Libai et al., 2020; Li & Xu, 2022). Its uses in manufacturing, marketing, finance, education, and healthcare among other industries provide companies better customer relationship management, product development, and data-driven strategic planning, and by extension influence their overall performance (Neha, Enakshi, Narotam & Amita, 2020).

Artificial Intelligence, big data, cloud computing, and Internet of Things (IoT) have been around for decades, however, their commercial viability and mainstream acceptance have increased dramatically in recent years, as a result of developments in computing power, open-source tools, and universal internet connectivity (Marston et al., 2011; Neha et al., 2020). For SMEs, this change offers both opportunities and obstacles; those that adopt new technologies can see notable performance improvements, while those who fall behind run the risk of becoming obsolete. AI's incorporation into company operations can help SMEs improve customer service via chatbots and smart assistants, streamline supply chain management, customise marketing campaigns, and obtain competitive insights from data analytics (Wagobera, Ejimuda, Idemudia & Ijomah, 2023; Abrokwah-Larbi & Awuku-Larbi, 2024). Moreover, the PricewaterhouseCoopers (PwC) (2017) projection that AI might add up to $15.7 trillion to the world economy by 2030 underlines its transformative power.

Though, there are great potentials, especially in emerging economies where technology knowledge, infrastructure, and investment capacity are poor, there is still a vital lack of knowledge on how AI adoption affects SME performance in these areas. This study, thus, aims to investigate the performance implications of AI adoption among SMEs as the broad objective. The study, however, seeks to specifically:

a) ascertain if the SMEs use Generative AI and ChatBots for Customer Relationship Management.
b) examine the effect of Generative AI and ChatBots usage on the Customer Relationship Management Capability of SMEs

REVIEW OF RELATED LITERATURE

Artificial Intelligence (AI)

When machines, applications and software are deployed and structured in such a way that they start reasoning like humans, making intelligent decisions and taking the burdens from humans, to face other more complex tasks, AI is said to be in action. In agreement with his assertion, Olan et al. (2022) opine that AI is the process of learning and expressing knowledge, and its core is enabling machines to reason and perform related activities, such as decision-making, problem-solving, and learning. It is the ability of machines to do what intelligent humans do (Ebuka et. al. 2023). Similarly, Arakpogun, Elsahn, Olan, and Elsahn (2021) argue that AI is a collection of information and communication technologies that imitate human intelligence. It enables machines to perform

cognitive functions previously associated only with human minds (Rai, Constantinides, & Sarker, 2019). It is believed to be a machine model technology that can effortlessly improve the capabilities of human intelligence (Dellermann, et al., 2021), by performing technical functions from simple ones to complex and advanced ones (Dellermann, et al., 2021; Chamorro-Premuzic, Polli & Dattner, 2019).

The use of data is prominent in the AI dynamics. It uses data to learn and to make decisions that are intelligent. To buttress this point, Grover, Kar, and Dwivedi (2022) opine that AI is the ability of a system to acquire knowledge by evaluating data obtained from its external environment. It can analyse data with high speed, quantity, and diversity, and process complex cognition, relationships, and structures by changing or replacing conventional human tasks (Verma et al., 2024). Manish and Nishtha (2023) state that AI is "the capacity of a computer or computerised robotic system to process data and produce results that are similar to the thought process of humans in learning, decision making, and problem-solving."

The end goal of AI is to solve problems that hitherto require a lot of brainwork to arrive at a decision. But with the deployment of AI, such decisions are reached at record time, with minimal error. This was why McCarthy (2007) (2006) averred that AI is the science and engineering of creating computer programs and hardware to learn and solve problems in ways that traditionally require human intelligence. On their part, Manish and Nishtha (2023) state that the purpose of AI systems is to "solve challenging problems in ways that resemble human logic and reasoning.

The deployment and solutions of AI in businesses can be felt in different areas. It is widely used in business applications, including automation, data analytics, and natural language processing (Kabir, 2025). It can be used to track user habits, provide recommendations, improve customer purchasing decisions and search results, communicate media, raise trade sales, improve organizational performance, and lower costs (Basri, 2020; Chan et al., 2019; Verma et al., 2024; Alam & Shabbir, 2022; Doe & Smith, 2025). It helps in improving user experience, optimising decision-making, and enhancing content marketing (Verma et al., 2024).

Generative AI

Generative AI (GenAI) models capable of producing new content, including text, photos, and designs, are being used by SMEs to provide unmatched gains in efficiency, creativity, and strategic agility. Recent studies highlight GenAI's good performance effects in SMEs. They increased operational efficiency, decision-making, and market competitiveness in South Africa, despite obstacles such as high implementation costs and low technical knowledge (Muzuva et al., 2024). Likewise, worldwide research shows that SMEs are embracing GenAI more and more to automate material generation and reduce marketing costs, hence levelling the playing field versus bigger rivals (Kshetri et al., 2024).

From the standpoint of organisational design, ethical practices and institutional forces moderate the performance effect of GenAI. GenAI's impact on corporate performance is greatly influenced by elements such as justice, openness, and organisational creativity (Rana et al., 2024). Moreover, GenAI is essential for workforce growth and capacity-building. Spanish SMEs with tech-savvy, well-trained managers were more likely to embrace GenAI, matching with improved company performance results (Huseyn et al., 2024).

A strategy framework for SMEs suggests a phased approach-beginning with low-risk AI tools, then progressing to task-specific and generative tools to assist in adoption. Ultimately, this approach

increases production and creativity by reducing obstacles such as cost and poor skill levels (Hussain & Rizwan, 2024). Regarding human aspects, effort anticipation and peer influence shape behavioural intent to use GenAI in SMEs; the perceived performance advantage grows more noticeable when adoption starts (Kim et al., 2024). Beyond economic performance, therefore, GenAI is found to improve supply chain resilience and support environmental, social, and governance (ESG) objectives in sectors like manufacturing and tourism, especially when included in digital platforms (Zhang & Huang, 2024; Yue, Kang & Zhang, 2025).

ChatBots

The ability of ChatBots to streamline operations, enhance customer engagement, and reduce service costs seems to be driving SMEs to integrate them into their operations. ChatBots are the most popular response to the question of how AI is applied in a corporate setting. Businesses can access the layers of data from the neural networks, such as consumer data and information, which have been accumulated over time, thanks to deep learning-powered AI ChatBots (Manish & Nishtha, 2023). When equipped with real-time access to client preferences and purchase history, ChatBots have an advantage over their human counterparts (Manish & Nishtha, 2023). Voice search and built-in ChatBots are widely recognised as prominent AI technologies that are highly favoured by customers for their ability to facilitate product discovery, information retrieval, and addressing common inquiries (Ebuka et. al. 2023). AI technology such as ChatBots can be used to automate routine customer service tasks, such as answering basic questions and handling routine inquiries. This can free up customer service staff to focus on more complex and high-value tasks, helping to improve the overall customer experience (Bandari, 2019).

Sharma et al. (2022) in their study found that key enablers of chatbot adoption in SMEs include top management support, financial resources, and employee capabilities. Their research, using the Technology–Organisation–Environment (TOE) framework, confirmed that ChatBots adoption enhances competitiveness and performance outcomes (Sharma et al., 2022). Similarly, Magdalena (2023) explored how AI chatbot features—such as responsiveness, ease of use, and human-like interaction can boost customer satisfaction and shopping intent, The study reported an 84.8% effectiveness rate using AI Markup Language (AIML) for SMEs (Magdalena, 2023).

In a study on the strategic role of chatbots in supply chain resilience by Panigrahi et al. (2023), the study found that chatbot adoption enhances supply chain visibility and innovation capability, both of which mediate positive effects on sustainable performance in SMEs (Panigrahi et al., 2023). From a user experience perspective, Selamat and Windasari (2021) identified that personalised, humanised chatbot interactions significantly improve customer enjoyment and intent to use, which in turn boosts business performance in SMEs (Selamat & Windasari, 2021). Kedi et al. (2024) conducted a review of chatbot marketing in SMEs, noting that AI chatbots improve customer interaction and reduce operational inefficiencies, especially when combined with personalised engagement strategies (Kedi et al., 2024). In a culturally specific context, Dharma et al. (2024) demonstrated that the perceived usefulness and cultural alignment of chatbots positively influence adoption in SMEs engaged in Halal product marketing, showing a direct link between tailored chatbot design and performance outcomes (Dharma et al., 2024).

Performance

Performance as it relates to organisations is generally seen as the effectiveness and efficiency with which the organisation meets its goals, encompassing both financial and non-financial outcomes. Enterprise performance is a measure of the degree to which a firm achieves its goals, and is also the final result of the operation (Folan & Browne, 2005). Unlike larger firms, SMEs often adopt more

flexible and informal performance measurement approaches due to resource constraints and simpler structures. According to Khan, Khalique, and Nor (2014), organizational performance in SMEs includes both subjective measures (such as managerial perceptions of growth and competitiveness) and objective measures (such as profit margins, sales growth, and market share), tailored to the scale and context of the enterprise (Khan et al., 2014).

Firms that embrace technology stay relevant in this ever-competitive and dynamic business environment. The Information Technology (IT) enabled organisational capabilities perspective proposes IT resources and capabilities as the enabling factors to develop organisational capabilities, thus, affecting firm performance (Benitez et al., 2018a). This theoretical perspective emphasises how technology creates business value (Braojos et al., 2019). Similarly, Sullivan and Fosso Wamba (2022); Olan et al. (2022) aver that earlier research suggests that embedded digital technology, such as AI, in organisational processes can optimally improve organisational performance. AI usage has been found to create digital options, optimise decisions, enhance productivity, and control costs, improving business performance (Demlehner et al., 2021; Dondapati et al., 2022). AI deployment in organisations can optimise marketing decision-making, improve the consumer experience, help build trust, and positively impact firm performance (WambaTaguimdje et al., 2020; Fawal et al., 2024).

Artificial intelligence has been hailed for its capacity to expedite data processing, enhance task feedback efficiency, reduce human mistakes, and ultimately increase production and favourable outcomes (Mehta & Pandey, 2022). The diverse and remarkable capabilities of AI have enhanced the operations of numerous small firms, even contesting the overwhelming supremacy of large corporations and organisations. AI has emerged as a feasible and reliable tool for SMEs in their pursuit of survival (Alade, 2023). Consequently, AI can be effectively utilised by expanding and prosperous enterprises at any moment, in any region, or within any civilisation (Alade, 2023).

Customer Relationship Management Capability

The ability of businesses to relate well with their customers could make or mar their business; it could be the difference between a thriving firm and one that is struggling. Hence, customer relationship management (CRM) capability is important to organisations of different shapes and sizes. CRM capabilities are the ability of enterprises to maintain long-term customer relationships and gain customer-level profits (Guerola-Navarro et al., 2021). It is the ability of firms to build continuous customer relationships by allocating organizational resources to meet different consumer desires, including key customers, value customers, and inactive customers (Wang, Y., & Feng, 2012; Guerola-Navarro et al., 2021). It reflects the firm's preparedness to go over and beyond to make sure that customers are satisfied.

In the current world, where technology plays a key role in different aspects of companies' life, CRM is not an exception with respect to technology influencing the way it is done. Using digital technology to help enterprises develop customer relationships and improve CRM performance is vital for e commerce enterprises (Wang & Sun, 2022). Bandari (2019) avers that AI technology can also help SMEs to personalise their marketing efforts, creating more meaningful and relevant interactions with customers, thereby influencing their CRM capabilities.

In a data-driven age, supported by technology, the core of CRM capabilities is to provide decision support for enterprises by mining customer data, thus satisfying customer needs and establishing long-term and mutually beneficial relationships, which is the end point of CRM (Li et al., 2019). On a similar note of underscoring the place of technology in CRM, Li and Xu (2022) opine that AI usage can help electronic-commerce enterprises quickly learn, judge, and make decisions based on large-scale data, gain insight into customer needs, and improve CRM capabilities. The integration of AI

into CRM systems offers significant benefits for SMEs in effectively managing customer data, forecasting customer behaviour, tailoring marketing campaigns, and enhancing CRM (Ebuka et. al. 2023).

Empirical Insights

Abdul Wahab and Radmehr (2024) conducted a study to investigate the effects of AI assimilation on firm performance (FP) in SMEs in Lebanon. The study employed a quantitative approach, utilising cross-sectional data collected from 417 SMEs. The study applied a moderated multi-mediation model, drawing on the Dynamic Capability View framework, to analyze the relationships between AI assimilation, customer agility (CA), absorptive capacity (AC), and firm performance. They also examined the moderating role of organisational agility (OA). The study findings revealed that AI assimilation positively impacted firm performance, with CA and AC acting as parallel mediators. Specifically, CA enhanced the ability of firms to rapidly detect and respond to customer-oriented opportunities, while AC enabled the effective acquisition and utilisation of knowledge for organisational benefits. Moreover, OA was found to strengthen the positive relationships between AI assimilation and both CA and FP, particularly in highly dynamic market environments.

Badghish and Soomro (2024) carried out a study that presented a theoretical model that identified the most influential factors affecting the adoption of AI by SMEs to achieve sustainable business performance in Saudi Arabia. The study utilised a quantitative method, using a survey instrument for the research. Data for the study were collected from managers working in six different sectors. Subsequently, based on company size, firms were divided into two groups, allowing multi-group analysis of SMEs to explore group differences. Hence, firm size played a moderating role in the conceptualised model. Data analysis was performed on SmartPLS 3, and the technique used was Structural Equation Modelling (SME), and the results suggested that relative advantage, compatibility, sustainable human capital, market and customer demand, and government support play a significant role in the adoption of AI. Moreover, the study found a significant influence of AI on SMEs' operational and economic performance. The multi-group analysis (MGA) results revealed significant group differences, with a medium-sized firm strengthening the relationship between relative advantage and AI adoption compared to small-sized firms.

Kopka and Fornahl (2023) carried out a study that investigated how the integration of AI into the knowledge base of firms influences their productivity and innovation performance, with a focus on the catch-up processes of SMEs in the European Union. The study employed a quantitative research design by merging firm-level data from the ORBIS database with patent data from PATSTAT, covering 79,698 firms that filed patent applications with the European Patent Office between 2010 and 2017. To assess the role of AI, the study distinguished between AI method patents and AI application patents. The study applied propensity score matching to control for endogeneity and selection bias, followed by ordinary least squares (OLS) regression models, incorporating two-way and three-way interaction effects to examine the moderating roles of firm size and proximity to the productivity frontier. The study found that the effects of AI integration on firm performance were highly contingent on firm size and their distance from the productivity frontier. Specifically, smaller firms operating close to the frontier experienced higher labour productivity growth through the adoption of AI application patents, suggesting these firms are more flexible and capable of rapid AI integration. Conversely, larger firms located further from the frontier benefited more from AI method patents in terms of innovative output, as they possessed the resources to undertake formal R&D activities. Interestingly, AI application patents exhibited a negative direct effect on productivity in general, but the interaction analysis revealed that small, latecomer firms were able to derive positive productivity gains when situated far from the productivity frontier.

Schönberger (2023) conducted a study to identify key applications and challenges of AI for SMEs in Germany. The study employed a quantitative research approach, utilising an online survey distributed via social media platforms such as LinkedIn and Instagram. The survey collected data from 105 SMEs using a standardised questionnaire with closed-ended questions. Statistical methods were applied to analyse patterns and trends in AI adoption, focusing on the experiences, challenges, and perceived benefits of AI implementation. The findings revealed that only 28% of SMEs surveyed had successfully integrated AI solutions, with chatbots and virtual assistants being the most commonly used applications. The study highlighted significant benefits of AI adoption, including improved efficiency, productivity, and decision-making. However, it also identified challenges such as privacy concerns, the need for specialised skills, and limited resources.

Younus, Zaidan and Mahmood (2022) examined the effect of AI and its associated variables on job performance of Small and Medium Enterprises (SMEs) in China. To collect data from the random sample, a questionnaire was constructed. 220 managers were included in the sample. Additionally, the study took a descriptive method and analysed the data using regression analysis. The findings indicated that AI has a statistically significant effect on employment. Additionally, the findings showed that gender, academic credentials, and years of experience all have a statistically significant impact on work performance.

Drydakis (2022) carried out a study that evaluated whether AI applications are associated with reduced business risks for SMEs during the COVID-19 pandemic. The study was conducted in London, England, and utilised the International Labour Organisation's (ILO) COVID-19 business risks scale to assess risks to people, processes, profits, and partnerships. To measure AI usage, a new 10-item scale was developed, capturing the application of AI in areas such as marketing, pricing, customer service, cash flow forecasting, cybersecurity, HR, and legal services. A longitudinal survey design was adopted, collecting data from 317 SMEs between April and June 2020 (first wave) and conducting a follow-up survey with 275 SMEs between October and December 2020 (second wave). The study employed quantitative methods, using random-effects regression models to estimate the association between AI adoption and business risks. The findings revealed that SMEs using AI applications experienced significantly reduced business risks compared to those that did not. Specifically, the use of AI applications was associated with a 3.1% reduction in COVID-19-related business risks, while each additional AI application used corresponded with a 3.8% further reduction. Key AI applications contributing to these outcomes included digital marketing tools to target customers online, AI-driven cash flow forecasting, and AI tools used in recruitment and HR activities. The study also found that medium-sized enterprises and more innovative firms benefited more from AI adoption than small enterprises and less innovative firms.

Abrokwah-Larbi and Awuku-Larbi (2022) conducted a study that examined the impact of AI in marketing (AIM) on the performance of SMEs in an emerging economy. The study employed a quantitative survey method, collecting data from 225 SME respondents registered with the Ghana Enterprise Agency in the Eastern Region of Ghana. SEM and path analysis were utilized to estimate the impact of AIM determinants—such as Internet of Things (IoT), Collaborative Decision-Making Systems (CDMS), Virtual and Augmented Reality (VAR), and Personalization—on SME performance, including financial, customer, internal business process, and learning and growth outcomes. The findings revealed that AIM had a significant and positive effect on SME performance across all dimensions, with IoT and personalisation emerging as critical determinants. IoT facilitated real-time interaction and communication, while personalisation created tailored customer experiences. VAR contributed by enhancing customer engagement through immersive visual simulations, and CDMS supported strategic decision-making with AI-powered insights.

Furthermore, the study provided practical implications for SME managers to adopt these AIM determinants strategically to improve business performance.

Damioli, Van Roy and Vertesy (2021) conducted a study that investigated the causal relationship between AI innovations and labour productivity at the firm level, using a global dataset. The study employed a quantitative method, analysing data from 5,257 firms that had filed at least one AI-related patent between 2000 and 2016. These firms spanned across various countries including Japan, South Korea, China, the United States, and major European economies. The study developed an augmented Cobb–Douglas production model and used System Generalised Method of Moments (GMM-SYS) for estimation to address endogeneity and firm-level fixed effects. The analysis drew on patent data from the PATSTAT database and firm-level financial data from the Bureau van Dijk's ORBIS database. The results indicated that AI patent applications had a significant and positive effect on labour productivity, particularly for SMEs and firms in the services sector. Further, the study found that this effect became more pronounced in the later years (2009–2016), suggesting a maturation of AI technologies. Non-AI patents also contributed to productivity, but to a lesser extent. Notably, multi-group analysis revealed that SMEs benefited more from AI adoption compared to larger firms, and services-oriented businesses experienced a stronger productivity impact than those in manufacturing.

Basri (2020) conducted a study to examine the impact of AI-assisted social media marketing (AISMM) on the performance of SMEs in Saudi Arabia. The study employed a survey technique, collecting both primary and secondary data from business operators and employees of start-up businesses and SMEs. Data analysis was performed using partial least square structural equation modelling (PLS-SEM). The findings revealed that AISMM practices significantly enhanced SME performance by increasing customer bases, profitability, and effective business management. The study also highlighted the mediating role of effective business management in improving SME performance. AISMM was shown to address marketing challenges faced by SMEs, such as limited resources and underdeveloped marketing strategies, thereby boosting overall business performance.

Methodology

This work adopts a survey research design because data for the study is collected using a questionnaire, making survey design the most suitable. The population of the study consist of 11,231 SMEs scattered across the five South-Eastern states of Nigeria. The choice of the five states in the southeast region of Nigeria is because of the enormous number of SMEs in these states, as the biggest market in West Africa (Onitsha Main Market) is located in one of the states (Anambra State), and there are other big markets there as well. The sample size of the study is 371, arrived at by applying the Krejcie and Morgan's 1970 sample size determination formula. The data for the study was collected using a structured questionnaire prepared using Google Form, therefore, while distributing the questionnaire, priority was given to SMEs whose owners are digitally literate to be able to answer and submit the questionnaire in electronically. The questionnaire was subjected to both validity and reliability, and both results showed that the questionnaire was both valid and reliable. A total of 310 copies were used for the study, as not all the electronically distributed copies were returned, and some of the collected/submitted copies were incompletely filled. The analysis was carried out using descriptive (mean, frequencies and tables) and inferential statistics (regression analysis). The hypothesis was tested at a 5% level of significance.

Data Analysis

Question 1: Do SMEs use Generative AI and ChatBots for Customer Relationship Management?

Table 1: Respondents' Responses to Ascertain if the Studied SMEs use Generative AI and ChatBots for Customer Relationship Management

S/N	Questionnaire Items	Yes	No	No Idea	Mean	Decision
	Generative AI					
1	Do you have an idea what generative AI is? those AI that can help you or your business to get content like tests, videos, pictures and music	200	110	-	1.65	Accept
1	I use computer tools to help me create things like messages, pictures, or videos.	102	208	-	1.3	Reject
2	I ask people to help me generate content using AI tools	81	229	-	1.26	Reject
3	My business relies on computer tools and programs to get ideas on what to post or write.	50	260	-	1.16	Reject
4	I use these tools to send better messages to my customers.	61	249	-	1.20	Reject
5	My workers and I know how to use these tools to generate ideas for my business.	78	201	31	1.15	Reject
6	My business has online platforms like Facebook, WhatsApp, Instagram, X, etc, where I use AI tools to generate and post content in	51	259	-	1.16	Reject
	ChatBots usage					
7	Have you heard of computer tools called ChatBots that can help you or your businesses reply to messages or enquiries and complaints from customers/clients or let them find out information about you or your business?	189	121	-	1.61	Accept
7	My business uses computer programs that talk to customers online.	41	269	-	1.13	Reject
8	I reply on chat tools to respond to customers' requests.	20	290	-	1.06	Reject
9	My customers get information about my business with the help of AI tools that speak to them first.	22	288	-	1.07	Reject
10	I have online platforms (s) like Facebook, WhatsApp, Instagram, X, Telegram, etc, where I use AI tools to chat and keep in touch with my customers	31	279	-	1.1	Reject

Source: Field Survey, 2025

Table 1 was designed to determine whether SMEs actively use AI tools, specifically GenAI and ChatBots for CRM. Using a benchmark mean score of 1.5 for acceptance, the results revealed limited AI usage among the SMEs. For GenAI, only the item assessing whether respondents had an idea of what it is had a mean score above the benchmark (Mean = 1.65), indicating a basic level of awareness among SME operators. However, all other items related to actual usage, such as using AI tools to create content, sending messages, or relying on AI for idea generation fell below the acceptance threshold. This suggests that while some SMEs are aware of GenAI, very few actually apply these tools in their business operations.

For ChatBot usage, although awareness was relatively high (Mean = 1.61), all items concerning practical usage, like using ChatBots to communicate with customers or relying on them to respond to inquiries, recorded mean scores below 1.5. This further confirms that the actual implementation of ChatBot technology in day-to-day CRM activities is still significantly lacking among the surveyed SMEs.

In summary, Table 1 reveals a substantial gap between awareness and usage of AI tools. While a reasonable proportion of SMEs are aware of AI technologies, actual adoption and integration of both Generative AI and ChatBots into their business processes remain minimal.

Question 2: Do Generative AI and ChatBots usage affect the Customer Relationship Management Capability of SMEs

Table 2: Respondents' Responses on Relationship between Generative AI, ChatBots usage and Customer Relationship Management

S/N	Questionnaire Items	SA (1)	A (2)	N (3)	D (4)	SD (5)	Mean	Decision
	Generative AI							
1	Using computer tools could help me create things like messages, pictures, or videos better.	29	90	-	115	76	2.62	Reject
2	AI tools can be used to generate better content for my business faster.	122	101	30	45	12	3.89	Accept
3	These AI tools can help me come up with new and creative ideas for my business.	100	138	40	32	-	3.88	Accept
4	These tools can be used to send better content to my customers.	89	110	15	77	19	3.56	Accept
	ChatBots usage							
5	Using computer programs that talk to customers online could make my business more customer-friendly.	70	51	40	89	60	2.94	Reject
6	These chat tools could help my business to answer customer questions quickly.	160	120	10	20	-	4.29	Accept
7	My customers could find the chat tools easy to interact with.	78	116	56	39	21	3.61	Accept
8	The chat tools can help to serve customers anytime, day or night.	100	143	10	57	-	3.92	Accept
9	The chat tools can make my customer service easier.	105	85	48	42	30	3.62	Accept
	Customer Relationship Management							
10	My customers will be happier when they get better content from me.	190	86	-	34	-	4.39	Accept
11	Customers are satisfied when they are responded to in a faster and better way.	140	120	29	11	10	4.19	Accept
12	Staying in touch with my most important customers using tech tools could make them happier.	101	107	33	69	-	3.77	Accept
13	AI tools could help me know what customers will need soon and how to get it for them.	60	51	40	80	79	2.79	Reject
14	Using computer tools can make my relationship with customers better.	106	84	23	59	38	3.52	Accept

Source: Field Survey, 2025

Table 2 examines the effect of GenAI and ChatBots on the CRM capabilities of SMEs, using a benchmark of 3.0 to determine acceptance. Responses show that certain aspects of GenAI are perceived positively. Items such as the use of AI to generate better content faster (Mean = 3.89), generate new business ideas (Mean = 3.88), and send better content to customers (Mean = 3.56) were all above the benchmark. This indicates that although usage is low (as Table 1 shows), those who understand GenAI recognise its potential to enhance creativity and communication in customer relations. However, the first item in this category, assessing the belief in AI's capability to improve content creation, fell below the threshold (Mean = 2.62), implying some scepticism or lack of hands-on experience with these tools.

For ChatBots, most respondents agreed that these tools could improve CRM outcomes. Items such as helping businesses respond to customer inquiries quickly (Mean = 4.29), making interaction easy (Mean = 3.61), and offering round-the-clock service (Mean = 3.92) were highly rated. This shows a strong recognition of the benefits ChatBots can bring to customer service. However, one item—regarding whether chat programs make a business more customer-friendly- recorded a borderline rejection (Mean = 2.94), indicating that not all respondents are convinced about the friendliness or personalisation that ChatBots may offer.

In terms of overall CRM capability, most responses were highly positive. Respondents agreed that better content and faster responses lead to higher customer satisfaction (Means = 4.39 and 4.19, respectively), and that staying in touch with key customers via tech tools is beneficial (Mean = 3.77). They also acknowledged that AI tools can strengthen customer relationships (Mean = 3.52). However, the perception that AI can predict customer needs (Mean = 2.79) did not meet the benchmark, highlighting a limitation in understanding or trusting predictive capabilities. In summary, Table 2 suggests that SMEs appreciate the potential impact of AI on improving CRM capabilities, even if actual adoption remains low. There is a clear distinction between usage (which is limited) and perceived benefit (which is high), highlighting an opportunity for capacity building, awareness programs, and support to foster greater AI integration among SMEs.

Test of Hypothesis

HA1: Generative AI and ChatBots usage have a significant effect on the Customer Relationship Management Capability of SMEs

Table 3: Model Summary for Hypothesis Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
1	.990[a]	.981	.981	.772	7945.373	.000[b]

a. Predictors: (Constant), CHATUSAGE, GENAI
Source: Field Survey, 2025

The hypothesis was tested using regression analysis, with Generative AI usage (GENAI) and ChatBot usage (CHATUSAGE) as the independent variables, and Customer Relationship Management Capability (CRM) as the dependent variable. The analysis was conducted at a 5% level of significance to determine whether the use of AI technologies by SMEs significantly predicts their capacity to manage customer relationships effectively. From the Model Summary (Table 3), the R value of 0.990 and R Square value of 0.981 indicate a very strong relationship between the independent variables (GenAI and ChatBots) and the dependent variable (CRM capability). Specifically, the R Square of 0.981 means that 98.1% of the variance in CRM capability can be explained jointly by the use of Generative AI and ChatBots. This high value suggests a highly predictive and statistically meaningful model. Furthermore, the F-statistic of 7945.373 and its associated p-value of 0.000 (which is less than 0.05) confirm that the model as a whole is statistically significant. This means that GenAI and ChatBot usage, taken together, significantly contribute to explaining differences in CRM capability among the SMEs studied, hence, the acceptance of the alternate hypothesis.

Table 4: Coefficients result for the Test of Hypothesis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.500	.157		9.533	.000
	GENAI	.538	.049	.458	10.879	.000
	CHATUSAGE	.525	.041	.537	12.770	.000

a. Dependent Variable: CRM

Source: Field Survey, 2025

Looking at the coefficients in Table 4, both independent variables were found to have a statistically significant effect on CRM capability. The unstandardized coefficient (B) for Generative AI is 0.538 with a t-value of 10.879 and a p-value of 0.000, while the B value for ChatBot usage is 0.525, the t-value is 12.770, and the p-value is also 0.000. Since both p-values are well below the 0.05 threshold, this indicates that each variable individually has a statistically significant positive effect on CRM capability. Moreover, the fact that the standardised beta coefficients for both Generative AI (0.458) and ChatBots (0.537) are strong and positive demonstrates that not only are these relationships statistically significant, but they also have a substantial effect on the dependent variable. Among the two predictors, ChatBot usage appears to have a slightly stronger standardised effect on CRM, suggesting that among SMEs that have adopted AI tools, ChatBots may currently play a more direct or visible role in improving customer engagement.

Discussion of Findings

The results of the current study provide critical insights into the level of adoption and the performance implications of Generative AI and ChatBots in customer relationship management (CRM) among Small and Medium Enterprises (SMEs) in Southeastern Nigeria. The findings are discussed in relation to prior empirical evidence to position the study within the broader literature on AI adoption and SME performance. The analysis of Table 1 reveals a significant gap between awareness and actual usage of AI technologies by SMEs. While a fair number of respondents indicated awareness of Generative AI, their actual use in daily business operations was minimal. This finding aligns with those of Schönberger (2023), who reported that although many German SMEs were aware of AI tools like ChatBots, only 28% had successfully integrated them into their operations. Similarly, Muzuva et al. (2024) found that the adoption of Generative AI in South African SMEs was constrained by limited technical knowledge and high costs, despite strong awareness and enthusiasm for the technology. However, the current study contrasts with findings from Abrokwah-Larbi and Awuku-Larbi (2022) in Ghana, where SMEs were reported to actively adopt AI in marketing, suggesting regional or contextual differences in digital readiness. The lower usage rate observed in southeastern Nigeria may be attributed to infrastructural limitations, insufficient digital skills, and lack of strategic support among SMEs—issues which Umetiti et al. (2025) and Ebuka et al. (2023) have previously highlighted as major constraints to digital adoption in the Nigerian SME landscape.

Despite low actual usage, Table 2 results show that SMEs have a generally positive perception of the potential impact of AI tools on CRM. Most items assessing the usefulness of Generative AI and ChatBots in enhancing customer communication, generating creative business content, and responding promptly to customer inquiries received mean scores above the acceptance benchmark of 3.0. For instance, statements like “AI tools can generate better content faster” and “Chat tools help to answer questions quickly” had high levels of agreement. This finding resonates with the empirical

work of Selamat and Windasari (2021), who emphasised that personalised ChatBot interactions significantly enhance customer engagement and satisfaction among SMEs. Likewise, Magdalena (2023) found that ChatBots significantly improved shopping intent and CRM performance, especially when they exhibit human-like interactivity and ease of use. Similarly, Wagobera et al. (2023) reported that AI ChatBots, when integrated into marketing platforms, improved customer interaction and service efficiency-results that are echoed in the present study's findings on perception. Yet, unlike Drydakis (2022), who observed that SMEs actively deploying AI during the COVID-19 pandemic reported reduced business risks and improved resilience, the current study shows that such perceived benefits have not yet translated into widespread implementation among Nigerian SMEs. This suggests that while the cognitive alignment with AI's value exists, the behavioural adoption is still lagging behind.

Most conclusively, the regression results in Tables 3 and 4 confirm the hypothesis that both Generative AI and ChatBots usage have a statistically significant and positive impact on CRM capability. This implies that the usage of Generative AI and ChatBots contributes positively to the CRM capability of SMEs. The more they deploy AI tools such as GenAI and ChatBot in their dealings with their customers, the more they will attend to and satisfy their customers' need to be treated well by prompt and tailored responses and feedback. These results are consistent with the findings of Abdul Wahab and Radmehr (2024), who used a moderated multi-mediation model to show that AI assimilation significantly enhances firm performance through improved customer agility and knowledge absorption. Likewise, Wamba-Taguimdje et al. (2020) found that embedded AI capabilities contributed to optimised decision-making and superior customer experiences, resulting in overall firm performance improvement. Moreover, the relative strengths of both predictors further highlight the practical implications of adopting AI technologies in customer management. These findings reinforce those of Panigrahi et al. (2023), who linked ChatBot usage with increased innovation capability and supply chain resilience, and Huseyn et al. (2024), who demonstrated that SMEs with trained personnel were more likely to leverage Generative AI for competitive advantage. However, this study also uncovers a discrepancy between statistical significance and real-world implementation. While the regression shows strong potential outcomes from AI adoption, the earlier descriptive analysis of actual usage reveals a very low implementation rate. This points to a latent potential for digital transformation that is not yet being fully tapped, likely due to contextual barriers such as cost, training, and infrastructure, as noted by Badghish and Soomro (2024) and Olan et al. (2022).

Conclusions

This study aimed to investigate the performance effects of Artificial Intelligence (AI) adoption, specifically Generative AI and ChatBots, on the Customer Relationship Management (CRM) capacities of Small and Medium Enterprises (SMEs) in southeastern Nigeria. The results indicated that although knowledge of AI tools is relatively high among SMEs, actual utilisation is very low. Nevertheless, SMEs that have embraced AI tools or possess a comprehension of their operation regard them as significantly advantageous for enhancing consumer engagement, producing innovative content, and addressing client requirements more effectively. The regression analysis indicated that both Generative AI and ChatBot usage have a statistically significant and beneficial effect on CRM capability, with ChatBot usage demonstrating a somewhat greater benefit. Notwithstanding these encouraging findings, the study underscores a distinct divergence between perceived value and actual execution. Obstacles such as insufficient technical expertise, elevated expenses, and infrastructural difficulties persist in hindering wider implementation. In conclusion, therefore, although AI offers significant opportunity for SMEs to improve customer relationship

management and overall performance, achieving these benefits will need intentional efforts to bridge the gap between awareness and implementation. Closing this gap will be essential for enhancing SME growth and competitiveness in a progressively digitised global economy.

Recommendations

Based on the objectives and findings of the study which focused on assessing the usage of Generative AI and ChatBots among SMEs and their effect on Customer Relationship Management (CRM), the following recommendations are proposed:

1. Enhance Digital Literacy and Technical Training for SME Owners and Employees:
2. Given the gap between awareness and actual usage of AI tools observed in the study, there is a critical need for targeted training programs to improve digital skills among SME operators. This programs, seminars, workshops, bootcamps and possibly online courses can be organized by the government and relevant authorities, major industry players in tech could also help in this regard to be able to translate the potential benefits into actual benefits for these SMEs in Southeast Nigeria.
3. Provide Subsidized Access to AI Tools and Platforms for SMEs:
4. The seemingly prohibitive costs of some AI tools could be contributing to a lack of implementation and adoption; hence, the government can step in to subsidise while the SMEs can leverage on shared tools and subscriptions to bring down the costs associated with adoption and implementation.
5. Development of Localized AI Solutions: in a bid to bridge the adoption gap, technology developers should create AI tools that are intuitive, mobile-friendly, and context-appropriate for local SME needs. This could be done in such a way as to make chatbots to respond or interact in local language. This could spur the rapid adoption of such tols, hence, boosting the performance of SMEs.
6. Encourage Peer-to-Peer Learning and SME Tech Communities: those SMEs that have successfully adopted and implemented AI tools for their businesses and are seeing the benefits can be incentivised to share their experiences through peer learning platforms or communities of practice. This could go a long way in fostering a culture of innovation, demystification of AI technologies, and enablement of other SMEs to learn from practical use cases relevant to their local context.

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