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## RESEARCH ARTICLE

# OPTIMIZING THE MARKETING PERFORMANCE OF SMALL BUSINESSES THROUGH THE INSTRUMENTALITY OF ARTIFICIAL INTELLIGENCE

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## ARTICLE DETAILS

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## ABSTRACT

Artificial Intelligence (AI) confers on organisations that use it some level of competitive edge over others; however, small and medium-scale enterprises (SMEs) in Africa still struggle to integrate it into their operations. This study, therefore, sought to examine how the marketing performance of SMEs can be optimised through AI adoption as the broad objective. Specifically, the study examined the relationship between ChatBot and customer engagement of SMEs in the South East, Nigeria. The study adopted a survey research design. The study's population was 11,231 registered SMEs across the 5 states in the region. A sample size of 371 was arrived at by applying the Krejcie and Morgan 1970 statistical formula. The instrument for data collection was a Likert scale-structured questionnaire, which was subjected to both validity and reliability tests. Data was analysed using both descriptive and inferential statistics, and the hypothesis formulated was tested at a 5% significance level. From the result, it showed that ChatBot has a statistically significant relationship with customer engagement among SMEs in South East, Nigeria ( $R = 0.947$ ;  $R\text{-Square} = 0.898$ ;  $F\text{-value} = 2777.594$ ;  $P\text{-value} = 0.000 < .05$  significant level). The study, therefore, concluded that the marketing performance of small businesses can indeed be optimised through AI deployments. Sequel to the findings of the study, it was recommended that small businesses in the studied areas need to incrementally adapt and adopt new and improved ways of responding to customers, in such a way as to make their responses swift, and all-day-round, as this will captivate the attention of the customers and make them more engaged.

### KEYWORDS

ChatBot, Customer Engagement, Marketing Performance, Small Businesses, Artificial Intelligence

## 1. INTRODUCTION

The place of small and medium-scale enterprises (SMEs) in the scheme of things, as it relates to economic growth and development of nations, has been well documented. A group researcher aver that SMEs are globally instrumental to industrialisation, economic growth and development (Arachie et al., 2025a). They help nations in their quest to provide employment for people and catalyse their economies towards growth and economic sustainability (Arachie et al., 2023). Therefore, anything that could help SMEs grow and sustain their businesses is usually a welcome development. To this end, technology has been playing its own role in ensuring that they remain competitive in a very hostile business environment, and they have to compete with bigger and more established firms in their operational environment.

The integration of cutting-edge technology in the operational dynamics of businesses is inevitable in a very complex market, as it plays a massive role in their competitiveness and overall performance outcomes (Sudirjo and Nugroho, 2024). Similarly, in a study posit that technology integration in all facets of human existence, including business operations, is increasingly becoming inevitable (Okereke et al., 2025). In this context, the use of technology is one of the crucial factors that affects the performance of SMEs in the current digital era (Kurniawan and Prihandono, 2024). Standing tall in the circle of technology advancements making waves lately

is Artificial Intelligence (AI), as there is copious empirical evidence backing this position.

Artificial Intelligence (AI) has practically gained momentum in virtually all sectors of the economy, ranging from health to industry, and from research to manufacturing. It continues to serve as one of the most innovative contemporary approaches to ever be applied in various domains such as business, finance and health (Bharadiya, 2023; Goodell et al., 2021; Ellahham et al., 2020). Since its inception, it has permeated many industries, transforming operations in areas such as customer service, manufacturing, energy, logistics, healthcare, and education (Ocran et al., 2024, cited in Arachie et al., 2025). Small businesses that fail to either adapt or adopt AI in their operations may be at risk of going extinct sooner, rather than later. Hence, to remain competitive, they need to consider integrating one form of AI in their business or another. One of the key areas they can consider adopting AI is in their marketing activities, as it serves as an area business can use to endear themselves directly to their customers and clients, as the case may be.

Awad avers that AI has evolved into a significant enabler of strategic marketing within SMEs, with capabilities previously the domain of large-scale and multinational firms (Awad, 2025). Similarly, some researchers opine that AI has fundamentally transformed business processes in different sectors, including marketing (Konečný et al., 2025). Small businesses can leverage AI to remain in the operational environment,

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through automating their marketing activities, using ChatBots to respond swiftly to customers' and clients' requests, questions and orders. AI is a competitive strategic enabler for participating in the digitally enabled marketplace, through data-driven decision-making, forecasting future states, and automating marketing (Akande et al., 2024; Barari et al., 2024). AI-driven tools can optimise advertising budgets, automate routine marketing tasks, and generate actionable insights from customer data, enabling more accurate market segmentation, personalised content delivery, and improved customer engagement that ultimately contribute to sales growth and business expansion, hence, optimising their marketing performance (Laksmono et al., 2026). However, it has been observed that small businesses, probably because of their size, constraints in the area of expertise, capital and experience, have not been fully integrating AI in their marketing activities, hence, limiting their marketing operations capabilities. Awad states that among the numerous encumbrances of SMEs from adopting AI are perceived cost, lack of qualified personnel, and weak strategic frameworks (Awad, 2025). Others include limited understanding of digital tools, insufficient technical skills, and budget constraints (Purnamasari et al., 2023; Wanda and Hijriatin, 2024). It is against this backdrop that this study seeks to examine how the marketing performance of SMEs can be optimised through AI adoption. Specifically, the study seeks to:

Examine the relationship between ChatBot and customer engagement of SMEs in the South East, Nigeria.

## 2. REVIEW OF RELATED LITERATURE

### 2.1 Artificial Intelligence

The underlying significance of Artificial Intelligence (AI) lies in its ability to think and act like humans who are intelligent. Therefore, making machines, computers, software programs and robots to think, behave and act like humans, marks the significant difference between AI and every other tool. A group researcher aver that AI is trying to get computers or devices to think and behave like a human being (Konečný et al., 2025). In a similar standpoint, explicate that AI is a machinery intelligence achieved via a set of computational procedures that allow machines to perform acts, like those performed by humans (Enshassi et al., 2024). Most of study posit that AI encompasses a wide array of procedures through which machines are trained to imitate and replicate human actions (Okwudiri et al., 2025; Adigwe et al., 2024). So, in all the operationalisation and conceptualisation of AI, there is a deliberate effort to see that AI tools act and mimic human thinking and decision-making capabilities.

The human-like capacity of AI enables it to make decisions in such a swift manner, using past data. The primary objective of AI is to create systems that can replicate human-like behaviour in tasks including perception, cognition, and decision-making (Prem, 2019). The technology confers the decision-making capability to computers, software and programs, effectively mimicking the human brain (Khatri, 2021). Therefore, AI must have some cognitive abilities. The manifestation of the cognitive abilities of machines makes them to be called AI (Arachie et al., 2023). Some researchers define it as the ability of computer systems to mimic human cognitive functions through machines, processors, and software, with the aim of performing data processing and analytical tasks (Konečný et al., 2025).

There is an array of tools that can be deployed for various functionalities in businesses. AI in use today include ChatBots, digital assistants, and machine learning (ML) (Devang et al., 2019). AI technologies like ML and natural language processing (NLP) help businesses such as SMEs to transform their operations, such as marketing and pricing (Arroyabe et al., 2024). Machine learning, computer vision, and NLP, as well as the availability of large datasets for algorithm training, are all forms of AI deployments with the potential of advancing the course of businesses, hence contributing to its growth significance (Arachie et al., 2025).

Artificial intelligence (AI) has become increasingly significant in the corporate sector, for many applications, such as NLP, automation, and predictive analytics (Kabir, 2020). A group of researchers further argue that it supports organisations by monitoring user behaviour, delivering personalised recommendations, enhancing consumer purchasing experiences, optimising communication, and increasing efficiency while reducing operational costs (Basri, 2020; Chan et al., 2019; Jabłońska and Pólkowski, 2017; Ulas, 2019; Ulrich et al., 2021). Furthermore, AI allows for process automation, predictive analytics, and content personalisation, which are very essential for organisations with limited resources (Nalendra et al., 2023).

Artificial Intelligence (AI) has profoundly altered digital marketing by improving personalisation, automation, and efficiency via essential applications such as consumer data analysis, content personalisation,

ChatBots, and predictive marketing (Laksmono et al., 2026). Numerous studies have underscored the advantages of integrating AI in marketing, accentuating its ability to facilitate the effective use of automation tools for value creation, harness ML algorithms for improved decision-making, and utilise sophisticated data analytics to optimise marketing strategies and enhance operational efficiency (Allioui et al., 2023; Bharadiya, 2023; Yaiprasert and Hidayanto, 2023).

### 2.2 ChatBots

One of the capabilities of AI is automated chatting or interaction, which makes it possible for businesses to respond to their customers throughout the day. Berry posits that ChatBots deployment is one of the most prominent manifestations of AI in businesses, especially for customer interactions and inquiries (Berry, 2023). They are one of the most popular responses to the question of how AI can be deployed in corporate settings (Arachie et al., 2025a). They are software programs that simulate human conversation through text or voice interactions. They leverage NLP, ML, and data analytics to effectively understand and respond to human inputs. Chatbots are widely acknowledged as significant AI technologies that are greatly preferred by consumers for their capacity to enhance product discovery, information retrieval, and the resolution of typical queries (Arachie et al. 2023).

ChatBots can be used to automate routine customer service tasks, such as answering basic questions and handling routine inquiries (Arachie et al., 2025). 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). They provide instant customer responses, enhancing satisfaction and reducing operational costs (Abbasi and Esmaili, 2024). The beauty of ChatBots is in their ability to provide real-time responses to customers. They make real-time and customised interactions possible, thereby boosting customer satisfaction and engagement (Diederich et al., 2022; Maedche et al., 2016; McTear et al., 2016).

Small businesses can perform better, have more loyal and engaged customers as a result of the real-time interaction capability conferred on them through ChatBots. A group researcher aver that through ChatBots ability to provide personalised, real-time customer interactions and automate routine tasks, SMEs are able to deliver superior customer service and streamline their operations (Kedi et al., 2024). It is one of the most promising AI tools that offers enormous solutions to SMEs' challenges in their marketing efforts (Kedi et al., 2024). The solution ChatBot brings to businesses has made it an integral part of their customer service and marketing strategies and operations, particularly for those who want to improve on their operational efficiency and customer engagement (Nwaimo et al., 2024b; Seyi-Lande and Onaolapo, 2024). ChatBots enhance scalability, allowing SMEs to manage a higher volume of customer interactions without proportional increases in staffing (Kedi et al., 2024). It can handle multiple inquiries simultaneously, reducing response times and ensuring consistent service quality (Obinna and Kess-Momoh, 2024a; Paul and Iyelolu, 2024).

### 2.3 Marketing Performance

The performance of small businesses, much like it is for big businesses, can be categorised into different forms, such as employee performance and organisational performance. The performance measures can be captured using qualitative measures such as customer loyalty, engagement and satisfaction, or quantitative measures like Return on Investment (ROI), profitability and Return on Asset (ROA). In explaining this, some researchers opine that performance in SMEs is complex, as it covers financial indicators such as profitability, as well as operational efficiency, customer satisfaction, and other business growth measures that could be categorised as qualitative (Sharabati et al., 2024). Performance measurement is a way to determine how well SMEs can compete and where they can improve, and to guide strategic choices (Sharabati et al., 2024). And one of those performance metrics that is usually used, especially when it has to do with marketing, is marketing performance.

The integration of AI into the marketing operations of businesses has been observed to be of significant help to such businesses. Kurniawan and Prihandono state that previous studies have shown that the integration of AI contributes positively to the improvement of marketing performance (Kurniawan and Prihandono, 2025). The ongoing evolution of AI is anticipated to enhance marketing practices through the development of data-driven, responsive, and customer-centric strategies, thereby augmenting the competitiveness and strategic decision-making of businesses across various scales, including SMEs (Nirwana et al., 2023).

AI enables the automation of marketing campaigns through the use of ChatBots, automated email marketing, and ML-based product recommendation systems that are able to improve operational efficiency

and personalised customer experiences, making for improved marketing performance via customer engagement (Schwaeke et al., 2024; Wagobera Edgar Kedi et al., 2024; Elhajjar, 2024).

Artificial Intelligence also provides a number of opportunities for companies to learn more about their customers, predict their needs, and actively engage them in communication (Campbell et al., 2020). It can be argued that AI cuts across all components of the marketing mix, significantly impacting not only how value is delivered to customers but also the marketing management operations themselves, and the functioning of entire organisations (Jarek and Mazurek, 2019).

AI can be used to decipher the target audience (market), personalise marketing content to be relevant, and effectively monitor and evaluate marketing performance (Ribhi et al., 2025). Field observations suggest that SMEs adept at promptly addressing customer concerns, producing compelling digital content, and providing uniform customer experiences have greater resilience during crises, as a result of enhanced marketing performance and capabilities (Rosanabila, 2026).

**2.4 Customer Engagement**

One of the key features of firms that last long in the ever-changing and ruthlessly competitive environment is keeping customers satisfied and engaged. Customer engagement is essential for establishing robust, enduring customer connections. Engaged customers are more inclined to make repeat purchases, offer constructive feedback, and promote the business (Kedi et al., 2024); hence, organisations that manage to get their customers engaged will certainly stand the test of time. There are different ways to make customers engaged, and using technology to respond swiftly to their complaints, enquiries and concerns is one of them.

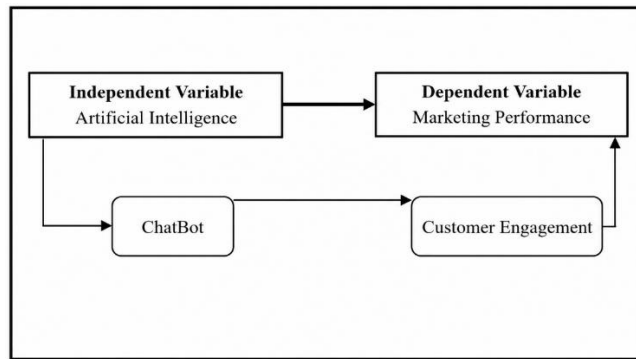
Timely and effective customer engagement, especially for small firms, is a key variable measure for business sustainability in an increasingly digitised world, and AI through automation tools like ChatBot plays an influential role in this (Sharabati et al., 2024). A group researcher aver that AI significantly enhances consumer engagement by facilitating more meaningful and personalised interactions between businesses and customers (Kedi et al., 2024). AI augments client involvement through diverse methods. By delivering instant support and tailored recommendations, AI ChatBots enhance the overall customer experience, making it more convenient and satisfying (Scott et al., 2024).

How fast customers get responses from businesses could be the only difference between customer loyalty and engagement and customer apathy and dissatisfaction, and by extension, their marketing performance.

In supporting this position, a group researcher opines that responsiveness is a key driver of customer satisfaction and loyalty, particularly in digital environments where speed and accuracy are highly significant (Novitasari et al., 2025).

Fully engaged customers generate 33% higher revenue and sales than actively disengaged customers (Sleiman et al., 2021). AI usage through tools such as ChatBot enhances operational efficiency and improves customer experiences and engagement (Rai et al., 2019). Additionally, AI-powered ChatBots provide immediate customer support, resolving queries and issues in real-time, and significantly improving customer engagement (Li et al., 2021).

**2.5 Conceptual Framework**



**Figure 1:** Conceptual Framework for the Study (Source: Researchers Conceptualisation, 2026)

The conceptual framework shows the variables of the study and the direction of the relationship in the study. Artificial intelligence and marketing performance are the major independent and dependent variables of the study respectively, as seen on top of the framework. ChatBot is the variable used in measuring AI, hence, it is the decomposed variable of AI, while customer engagement is used to operationalise marketing performance as the specific dependent variable of the study. The arrows show the direction of the relationship, flowing from left to right, signifying a positive relationship/direction.

**3. METHODOLOGY**

This study adopts a survey research design, as a result of the key features of the study, which involves collecting data from sampled respondents, about a phenomenon using a questionnaire. All these features make survey design the most suiting to the work. The South-Eastern region of Nigeria was selected for the study because of the concentration of small businesses across the five states of the region. Given that the region is home to two of the top ten biggest markets in Africa (Onitsha Main Market and the Nnewi spare parts market). The study’s population is 11,231 Corporate Affairs Commission (CAC) registered SMEs. A sample size of 371 was arrived at by applying the Krejcie and Morgan 1970 statistical formula. The instrument for data collected was a Likert scale structured questionnaire, which was subjected to validity (face and content validity) and reliability test (Cronbach Alpha), which resulted to an alpha value of .898. Four research assistants, drawn from undergraduates from the Business Administration Department in Nnamdi Azikiwe University, Awka, were engaged for the data collection. While distributing, emphasis was given to digitally literate SMEs who have engaged in digital marketing in any form before. In accordance with the sample size, a total of 371 copies of the questionnaire were distributed in a proportionate format across the five states involved. In the end, 329 copies were collected, out of which 319 copies were finally used for the research, because 10 of the retrieved copies were unusable to be used due to missing data and mutilation. Data was analysed using both descriptive and inferential statistics. The descriptive statistic consisted of tables, frequencies and mean, while the inferential statistics was Ordinary Least Square (OLS) Regression Analysis. The hypothesis formulated was tested at a 5% significance level.

**3.1 Data Presentation and Analysis**

Table 1: Distribution of Responses on ChatBot and Customer Engagement								
No	Questionnaire Items	SA	A	N	D	SD	Mean	Decision
ChatBot								
1	I use technology to respond to my potential customers always when they come to me from my adverts.	10	35	-	176	98	2.00	Reject
2	I have tools that help my customers get information anytime of the day about my business.	18	40	-	150	111	2.07	Reject

**Table 1 (Cont):** Distribution of Responses on ChatBot and Customer Engagement

3	I address and respond to my customers myself when they need information.	117	143	-	59	-	4.00	Accept
4	My business have automatic responders to my customers any day, any time.	-	41	-	121	157	1.76	Reject
5	I do not really fancy using tools to interact with my potential customers, I just do it myself.	120	140	9	50	-	4.03	Accept
Customer Engagement								
6	My customers always like the way I respond to them using technology.	34	67	12	111	95	2.48	Reject
7	The customers of my business engage in our adverts very well because they get quick responses.	45	44	9	79	142	2.28	Reject
8	My customers are always happy with the way I respond to their enquiries.	30	77	32	80	100	2.55	Reject
9	Customers of my business commend how we try to make things easy for them when they need information.	76	112	9	50	72	3.22	Accept
10	My customers usually complain about how slow my responses to them are.	19	45	10	114	131	2.08	Reject

Source: Field Survey, 2026

Table 1 presents the mean responses of respondents on ChatBot usage and customer engagement among SMEs, using 3.00 as the decision benchmark for acceptance. The results show that the statements that businesses use technology to respond to potential customers when they come from adverts (Mean = 2.00), that businesses have tools that help customers obtain information at any time of the day (Mean = 2.07), and that businesses have automatic responders to customers at any day and time (Mean = 1.76) all recorded mean scores below the benchmark and were therefore rejected. However, the statements that business owners personally address and respond to customers when they need information (Mean = 4.00) and that they prefer interacting with customers themselves rather than using automated tools (Mean = 4.03) recorded mean scores

above the benchmark and were accepted. With respect to customer engagement, the statements that customers like the way businesses respond to them using technology (Mean = 2.48), that customers engage well with adverts because of quick responses (Mean = 2.28), that customers are happy with how their enquiries are handled (Mean = 2.55), and that customers complain about slow responses (Mean = 2.08) all recorded mean scores below the acceptance threshold and were rejected.

However, the statement that customers commend the efforts of businesses in making it easy for them to obtain information recorded a mean score of 3.22, which is above the benchmark and was therefore accepted. Overall, the result suggests that most SMEs do not significantly use ChatBots or automated tools for customer interaction, as they prefer responding to customers personally.

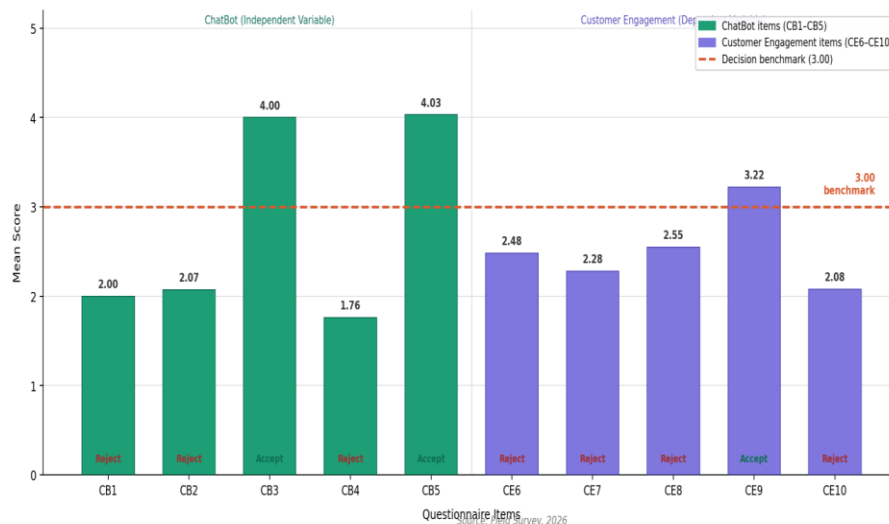


Figure 2: Bar Chart for Mean Scores

Figure 2 presents a bar chart showing the mean scores of respondents across ten questionnaire items measuring ChatBot usage as the independent variable (items CB1–CB5) and Customer Engagement as the dependent variable (items CE6–CE10). The horizontal dashed line at 3.00 represents the decision benchmark, above which items are accepted as reflecting the views of respondents, and below which items are rejected. The bar chart reinforces the pattern observed in Table 1, that SMEs in the study area have not significantly adopted ChatBot or other AI-driven tools for customer interaction, which correspondingly limits the depth of customer engagement they are able to achieve. This gap between current practice and the potential of AI-enabled responsiveness underscores the central argument of this study.

### 3.2 Test of Hypothesis

ChatBot has a statistically significant relationship with customer engagement of SMEs in Anambra State, Nigeria.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.947 <sup>a</sup>	.898	.897	2.150

a. Predictors: (Constant), CHTBT

**Key:**

CHTBT: ChatBot

Table 2 presents the model summary showing the relationship between ChatBot usage and customer engagement among SMEs.

The correlation coefficient (R = 0.947) indicates a very strong positive relationship between ChatBot and customer engagement.

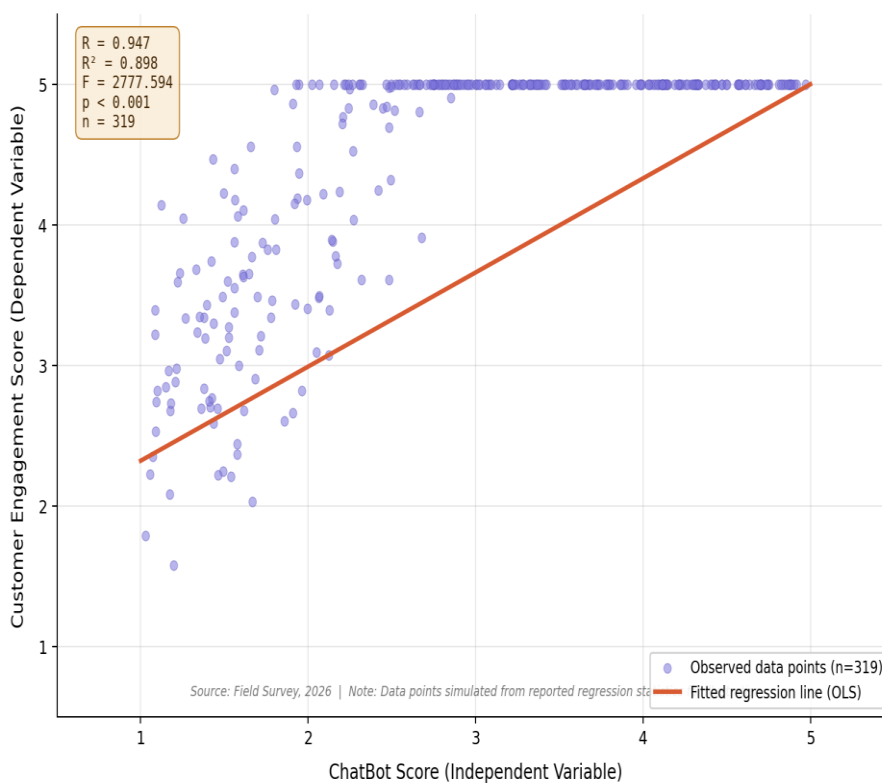


Figure 3: Regression Scatter Plot

Figure 3 presents a scatter plot illustrating the nature and direction of the relationship between ChatBot usage scores (independent variable, plotted on the horizontal axis) and Customer Engagement scores (dependent variable, plotted on the vertical axis) among the 319 SME respondents used in the final analysis.

The fitted Ordinary Least Squares (OLS) regression line is superimposed on the scatter plot to show the direction and strength of the linear relationship between the two variables. As is evident from the chart, the data points are distributed in a clearly upward-sloping pattern from the lower left to the upper right of the plot, indicating a strong positive relationship between ChatBot adoption and customer engagement.

The R Square value of 0.898 implies that 89.8% of the variation in customer engagement is explained by ChatBot, while 10.2% is explained by other factors not included in the model. The Adjusted R Square value of 0.897 further confirms the strong explanatory power of the model, while the standard error of the estimate (2.150) indicates that the model has a good predictive capability.

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	12840.158	1	12840.158	2777.594	.000 <sup>b</sup>
	Residual	1465.416	317	4.623		
	Total	14305.574	318			

a. Dependent Variable: CUSTENG

b. Predictors: (Constant), CHTBT

**Key:**

CUSTENG: Customer Engagement

Table 3 presents the ANOVA results used to test the significance of the regression model. The results show an F-value of 2777.594 with a significance level (p-value) of 0.000, which is below the 0.05 level of significance.

This indicates that the regression model is statistically significant. Therefore, the null hypothesis is rejected while the alternative hypothesis is accepted, implying that ChatBot has a significant relationship with customer engagement among SMEs in Anambra State, Nigeria.

This means that as SMEs increase their use of ChatBot tools for customer interaction, the level of customer engagement correspondingly increases. The tight clustering of data points around the regression line further reinforces the strength and consistency of this relationship.

### 4. CONCLUSION

Small businesses can rarely compete with big multinational firms, as a result of huge gap in both human and capital resources, however, with technology infusion into the activities of SMEs in different areas of business operations, they can now relatively compete. One of the areas of technological, and by extension, AI integration is in marketing, which is

why this study examined how AI can be used to optimize the marketing performance of small businesses. The study found out that ChatBot, which is a variable used in measuring AI in the study, had a statistically significant relationship with customer engagement, a variable used in capturing marketing performance. The study, therefore, concludes that the marketing performance of small businesses can indeed be optimized through AI deployments.

## RECOMMENDATION

Sequel to the findings of the study, the following are recommended:

- Small businesses in the studied areas need to incrementally adapt and adopt new and improved ways of responding to customers, in such a way as to make the responses swift and all-day-round, as this will captivate the attention of the customers and make them more engaged with the SMEs.
- Small business owners need to start thinking of leveraging cloud capacities and shared tools to reduce the burden and cost of deploying some tools that can help them interact with customers in real-time, so as to make them more engaged.

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