INTERNATIONAL JOURNAL OF BUSINESS AND MANAGEMENT RESEARCH
P-ISSN: 1118-4256, E-ISSN:3034-4327
Vol. 5| No.3 | December 2024
Page No.: 143 - 171

AI-DRIVEN CUSTOMER RELATIONSHIP MANAGEMENT PRACTICES AND SUSTAINABLE GROWTH OF NIGERIAN SMEs

Joseph AZAGE[1],
orcid.org/0000-0002-1582-2854, azagejoseph@gmail.com

Peter Chiazor IKPEAZU[2]
ikpeazupeterock@gmail.com

[1,2]Department of Business Administration, Faculty of Management Sciences, University of Benin, Benin City, Edo State, Nigeria

Abstract

This study explored the impact of AI-driven customer relationship management (CRM) practices on the sustainable growth of small and medium-sized enterprises (SMEs) in Nigeria. The research focused on the use of AI in customer data management, interaction automation, customer segmentation, predictive analytics, engagement strategies, and sales optimisation. A field survey conducted in 2024 collected data from 450 SMEs across Nigeria, using a random sampling technique. Data were gathered through structured questionnaires and analysed using descriptive and inferential statistics. The results demonstrated that AI-driven CRM practices, particularly in customer data management, interaction automation, customer segmentation, predictive analytics, and sales optimisation, significantly enhance the sustainable growth of Nigerian SMEs. Engagement strategies, while important, showed a weaker correlation. The study recommends that SMEs in Nigeria integrate AI-driven CRM tools to improve operational efficiency, customer satisfaction, and long-term growth. Additionally, investment in AI technology and staff training on its effective utilisation is essential for aligning CRM practices with sustainable growth objectives.

Keywords: AI-Driven Customer, Sustainable Growth, Customer Data Management, Interaction Automation, and Predictive Analytics

JEL classification: M15, M31, O33

Introduction

In today's competitive business environment, the integration of artificial intelligence (AI) into customer relationship management (CRM) has become essential for enhancing operational efficiency and driving sustainable growth, especially for small and medium-sized enterprises (SMEs). The Nigerian SME sector, a major contributor to the nation's economy, faces significant challenges in maintaining a competitive edge and ensuring long-term profitability (Ewuga, Egieya, Omotosho, & Adegbite, 2023). AI-driven CRM systems offer a promising solution by providing businesses with tools to better engage customers, streamline operations, and improve decision-making processes (Li et al., 2020; Guerola Navarro et al., 2021). As the digital economy expands, AI technologies within CRM frameworks thus present a transformative opportunity for Nigerian SMEs.

AI-driven CRM incorporates advanced technologies, such as machine learning, natural language processing, and predictive analytics, to optimise the management of customer relationships. These systems enable businesses to automate customer interactions, personalise marketing efforts, and generate actionable insights from large datasets (Saura et al., 2021). By leveraging AI, SMEs can enhance customer retention, increase sales, and improve service delivery (Chandra & Kumar, 2018; Komarek et al., 2020). For Nigerian SMEs, where resources are limited, AI can significantly reduce operational costs and support growth by improving CRM performance and decision-making (Johnson et al., 2022; Olan et al., 2022).

Sustainable growth, defined as the ability to scale operations while ensuring financial, social, and environmental viability, is often hindered for Nigerian SMEs by external factors such as economic instability and infrastructural deficits (Zhang et al., 2020; Zhao et al., 2021). However, AI-driven CRM has the potential to address these challenges by enhancing operational efficiency and customer satisfaction, thus promoting long-term success (Demlehner et al., 2021). This study seeks to explore how the adoption of AI in managing customer relations can enhance performance and contribute to sustainable growth for Nigerian SMEs.

Statement of the Research Problem

The growth of small and medium-sized enterprises (SMEs) is critical to the economic development of Nigeria, given that SMEs account for a significant percentage of employment and contribute substantially to the country's GDP (Shiro & Abiola, 2023). However, despite their importance, Nigerian SMEs face numerous challenges in achieving sustainable growth, particularly in a fast-changing digital economy. While customer relationship management (CRM) systems have proven effective in enhancing business growth, the integration of artificial intelligence (AI) into CRM remains underexplored in the Nigerian SME context. Most existing studies on AI-driven CRM focus on large corporations or Western markets, leaving a geographical gap in understanding its application and benefits for SMEs in developing economies like Nigeria (Ewuga, Egieya, Omotosho, & Adegbite, 2023, Chaudhuri, Chatterjee, Vrontis, & Chaudhuri, 2022; Li, Lin, Luo & Luo, 2023; Li, & Xu, 2022). This highlights the need for research that addresses how AI-CRM can contribute to the sustainable growth of Nigerian SMEs.

There is a lack of sufficient studies that examine the relationship between specific AI-driven CRM practices, such as customer data management, interaction automation, and predictive analytics, and the long-term performance of SMEs. While global research

highlights the potential of these technologies to enhance customer engagement and operational efficiency, very few studies focus on SMEs in Nigeria, where technological adoption is often slower and more challenging due to financial and infrastructural limitations (Amarasinghe, 2023; Rahman, Bag, Gupta, & Sivarajah, 2023; Abrokwah-Larbi, & Awuku-Larbi, 2024). This creates a significant gap in the literature, as the potential benefits of AI-driven CRM in improving customer loyalty, retention, and overall business sustainability among Nigerian SMEs remain largely unexplored.

Moreover, there is a lack of understanding of how AI-driven CRM practices specifically impact the sustainable growth of SMEs within the Nigerian context. Previous studies have largely focused on isolated CRM elements such as customer segmentation or sales optimisation, often without considering how these elements work in synergy to drive long-term business success (Bilgeri, 2020). The few studies that do exist have tended to overlook critical factors like customer engagement and customer retention, which are vital for sustainable growth. Additionally, conflicting theories on the role of AI in business operations present further challenges, as some scholars argue that AI may replace traditional CRM practices, while others believe it enhances them (Bauer, Galvan, Hancock, Hunter, Nelson, Riley & Tanner, 2024). This lack of consensus underscores the necessity of a comprehensive study that investigates how AI-driven CRM can be effectively leveraged to support sustainable growth in Nigerian SMEs.

Another key gap in the literature lies in the methods of analysis used in previous studies. Many existing studies have relied on qualitative approaches, such as interviews and case studies, without integrating quantitative methods that could provide more generalisable results (Khan & Iqbal, 2020; Naslednikov, 2024). This limitation has led to an insufficient understanding of the measurable impact of AI-CRM on key performance indicators of SME growth, such as profitability, market expansion, and customer satisfaction. To address

this, the current study employed a quantitative approach to provide a more robust analysis of the relationship between AI-driven CRM practices and sustainable growth in Nigerian SMEs.

In light of these gaps, the choice of the specific objectives for this study is well justified. By investigating the relationship between customer data management, interaction automation, customer segmentation, predictive analytics, engagement strategies, and sales optimisation, this study aims to provide a comprehensive understanding of how AI-CRM practices can enhance the sustainable growth of Nigerian SMEs. Addressing these objectives will contribute to filling the gaps in knowledge and provide practical insights for business owners and policymakers on the effective use of AI-driven CRM to achieve long-term success in the Nigerian SME sector.

Objectives of the Study

The broad objective of this study is to examine AI-driven customer relationship management practices and sustainable growth of Nigerian SMEs. The specific objectives are to:

i. identify the relationship between customer data management and the sustainable growth of Nigerian SMEs.
ii. investigate the relationship between interaction automation and the sustainable growth of Nigerian SMEs.
iii. ascertain the effect of customer segmentation on the sustainable growth of Nigerian SMEs.
iv. determine the effect of predictive analytics on the sustainable growth of Nigerian SMEs.

v. examine the effect of engagement strategies on the sustainable growth of Nigerian SMEs.
vi. observe the relationship between sales optimisation and the sustainable growth of Nigerian SMEs.

Research Hypotheses

The following hypotheses in objective form were used for this study.

H_1: There is no significant relationship between customer data management and the sustainable growth of Nigerian SMEs.

H_2: There is no significant relationship between interaction automation and the sustainable growth of Nigerian SMEs.

H_3: There is no significant relationship between customer segmentation and the sustainable growth of Nigerian SMEs.

H_4: There is no significant relationship between predictive analytics and the sustainable growth of Nigerian SMEs.

H_5: There is no significant relationship between engagement strategies and the sustainable growth of Nigerian SMEs.

H_6: There is no significant relationship between sales optimisation and the sustainable growth of Nigerian SMEs.

Literature Review

Sustainable Growth

Sustainable growth refers to the ability of an organisation to expand its operations, revenue, and market presence in a manner that is economically viable, socially responsible, and environmentally sustainable over the long term (Rosário, Raimundo, & Cruz, 2022; Sheth & Parvatiyar, 2021). It implies growth that does not compromise future resources or opportunities and balances short-term profitability with long-term sustainability, ensuring

that a business can thrive in a competitive and dynamic environment (Haessler, 2020; Miceli, Hagen, Riccardi, Sotti, & Settembre-Blundo, 2021).

The concept is multi-dimensional, encompassing financial, social, and environmental aspects. Financially, sustainable growth is marked by consistent revenue increases, profitability, and prudent resource allocation (Ahmeti, Kalimashi, Ahmeti, & Ahmeti, 2024; Yang, Yu, & Li, 2023). Socially, it involves maintaining ethical business practices, promoting employee well-being, and engaging with communities in ways that foster trust and loyalty (Agu, Iyelolu, Idemudia, & Ijomah, 2024; Ahmeti, Kalimashi, Ahmeti, & Ahmeti, 2024). Environmentally, businesses pursuing sustainable growth focus on minimising their ecological footprint through practices such as waste reduction, energy efficiency, and sustainable sourcing (Ahmeti, Kalimashi, Ahmeti, & Ahmeti, 2024; Sanchez-Planelles, Segarra-Oña, & Peiro-Signes, 2022).

Sustainable growth is becoming increasingly relevant in today's global economy due to rising consumer awareness and regulatory demands for responsible business practices (Rosário, Raimundo, & Cruz, 2022; Sheth & Parvatiyar, 2021). Companies, particularly small and medium-sized enterprises (SMEs), are now recognising that growth strategies must align with sustainability goals to ensure longevity and avoid the risks associated with environmental degradation or social instability (Miceli, Hagen, Riccardi, Sotti, & Settembre-Blundo, 2021). In this context, sustainable growth is no longer an option but a necessity for businesses that aim to thrive in the 21st century.

AI-Driven Customer Relationship Management Practices

AI-driven customer relationship management (CRM) practices refer to the application of artificial intelligence technologies in managing customer interactions, enhancing customer experiences, and improving business-customer relationships. AI in CRM leverages tools

such as machine learning, natural language processing, and predictive analytics to automate, personalise, and optimise customer-related processes (Benitez et al., 2022). These technologies enable businesses to better understand customer behaviour, predict trends, and provide tailored services, significantly improving customer engagement and loyalty (Fosso Wamba, 2022).

AI-driven CRM practices encompass various components, such as customer data management, where AI assists in collecting and analysing vast amounts of customer data to offer actionable insights (Ghasemaghaei & Turel, 2021). Interaction automation is another key aspect, utilising AI-powered chatbots and virtual assistants to handle customer inquiries, thereby enabling faster and more efficient responses (Chatterjee et al., 2021). Furthermore, predictive analytics empowers businesses to forecast customer needs and preferences, improving marketing strategies and sales performance (Benitez et al., 2020a). The integration of AI into CRM has revolutionised traditional methods by making customer relationship management more proactive, data-driven, and cost-effective. AI not only automates routine tasks but also enhances decision-making through real-time data analysis, ultimately leading to higher customer satisfaction and retention rates (Demlehner et al., 2021). This shift is particularly beneficial for small and medium-sized enterprises (SMEs), as AI-CRM systems offer scalability and efficiency that were previously only available to larger corporations (Ghasemaghaei & Calic, 2020).

In recent years, the adoption of AI-driven CRM has expanded due to the growing need for businesses to adapt to digital transformation and remain competitive in an increasingly customer-centric market (Benitez et al., 2018a). By leveraging AI, companies can optimise their CRM strategies, driving growth and ensuring sustainability in today's dynamic business environment.

Customer Data Management

Customer data management refers to the systematic collection, storage, and analysis of customer information to optimise interactions, enhance decision-making, and improve business performance. In the context of AI-driven customer relationship management (CRM), customer data management involves the use of advanced technologies such as machine learning and data analytics to process large volumes of customer data, deriving valuable insights that inform personalised marketing strategies, customer service improvements, and product development (Fosso Wamba, 2022).

Effective customer data management allows businesses to create a comprehensive view of their customers by integrating data from various sources, including purchase history, social media activity, and customer feedback (Benitez et al., 2020a). This data-driven approach helps companies anticipate customer needs, enhance customer satisfaction, and build stronger, more meaningful relationships with their clientele (Ghasemaghaei & Turel, 2021).

Furthermore, AI technologies in customer data management enable the automation of data processing, making it easier for businesses to segment customers, predict future behaviours, and tailor products or services to individual preferences (Demlehner et al., 2021). The importance of efficient data management is especially pronounced in small and medium-sized enterprises (SMEs), where optimising limited resources is crucial for competitive advantage and growth (Chatterjee et al., 2021).

As businesses increasingly move towards digital transformation, customer data management is becoming a critical component of sustaining long-term success, enhancing decision-making and allowing for a more targeted and efficient approach to customer engagement (Benitez et al., 2018a).

Interaction Automation

Interaction automation refers to the use of artificial intelligence (AI) technologies to streamline and automate customer interactions across various communication channels. This process involves deploying AI tools such as chatbots, virtual assistants, and automated messaging systems to handle customer inquiries, support requests, and routine tasks without the need for human intervention (Fosso Wamba, 2022). By automating repetitive interactions, businesses can provide faster, more consistent responses, enhancing the customer experience and improving operational efficiency.

In AI-driven customer relationship management (CRM), interaction automation enables organisations to manage high volumes of customer queries seamlessly, ensuring 24/7 availability and reducing response times (Benitez et al., 2020a). Automated interactions also allow for the personalisation of services, as AI systems can analyse customer data in real-time to offer customised responses or product recommendations (Chatterjee et al., 2021).

Interaction automation is particularly valuable for small and medium-sized enterprises (SMEs), as it enables them to scale their customer service operations without a proportional increase in staffing costs (Demlehner et al., 2021). Additionally, it frees up human employees to focus on more complex tasks that require personal attention or creativity, thus balancing efficiency with high-quality customer service (Ghasemaghaei & Calic, 2020). The adoption of interaction automation has been accelerated by advancements in AI technology, making it a key component in modern business strategies aimed at improving customer engagement, satisfaction, and loyalty (Benitez et al., 2022).

Customer Segmentation

Customer segmentation refers to the process of dividing a company's customer base into distinct groups based on shared characteristics such as demographics, behaviour, purchasing patterns, or preferences. In AI-driven customer relationship management (CRM), customer segmentation is enhanced through the use of advanced analytics and machine learning algorithms, which allow businesses to identify more granular segments and predict future behaviours (Ghasemaghaei & Turel, 2021). This data-driven approach provides a deeper understanding of customers, enabling businesses to tailor their marketing strategies, product offerings, and communication to meet the specific needs of each segment.

AI-powered customer segmentation improves accuracy by analysing large datasets from various sources, including transaction history, social media interactions, and browsing patterns, to uncover meaningful insights (Fosso Wamba, 2022). By doing so, businesses can identify high-value customers, target promotions more effectively, and allocate resources where they will generate the most impact (Di Vaio et al., 2020). This level of personalisation fosters stronger customer loyalty and enhances overall customer satisfaction.

For small and medium-sized enterprises (SMEs), effective customer segmentation is critical, as it enables them to compete more effectively by focusing their efforts on the most profitable or promising customer segments (Chatterjee et al., 2021). Moreover, by leveraging AI in customer segmentation, SMEs can optimise their marketing spend, reduce customer churn, and ultimately drive sustainable growth (Benitez et al., 2020a). The growing importance of personalised marketing and customer-centric strategies makes AI-driven customer segmentation a vital tool for businesses aiming to enhance engagement and achieve long-term success in a competitive market (Adebayo & Kehinde, 2021).

Predictive Analytics

Predictive analytics refers to the use of statistical techniques, machine learning algorithms, and data mining to analyse historical data and make forecasts about future customer behaviours, trends, and outcomes. In the realm of AI-driven customer relationship management (CRM), predictive analytics allows businesses to anticipate customer needs, personalise offerings, and optimise decision-making processes (Badawi et al., 2022; Zhang et al., 2020). This capability provides companies with insights into potential customer actions, such as purchasing patterns, product preferences, and likely churn, enabling proactive measures to enhance customer retention and satisfaction.

AI-enhanced predictive analytics processes large datasets, including transaction history, social media behaviour, and customer feedback, to uncover hidden patterns and correlations that would otherwise be missed through manual analysis (Fosso Wamba, 2022; Wang et al, 2016). For example, by analysing customer interaction data, businesses can predict which products are likely to be in demand, allowing them to adjust inventory and marketing strategies accordingly (Choudhury et al., 2021; Ghasemaghaei & Calic, 2020). For small and medium-sized enterprises (SMEs), predictive analytics offers a competitive edge by allowing them to optimise resource allocation, minimise risks, and target the right customers at the right time (Awan et al., 2020; Brougham & Haar, 2020). This enables SMEs to achieve greater efficiency, improve sales performance, and sustain long-term growth. Furthermore, predictive analytics enhances customer engagement by delivering personalised experiences that resonate with individual customer preferences, thereby increasing loyalty and repeat business (Dalla Pozza et al., 2018; Wang et al, 2022). In today's data-driven economy, the integration of predictive analytics into CRM systems is essential for businesses looking to maintain relevance and competitiveness in the market (Chatterjee et al., 2021).

Engagement Strategies

Engagement strategies refer to the various approaches businesses use to foster meaningful interactions with customers, build loyalty, and enhance long-term relationships. In the context of AI-driven customer relationship management (CRM), these strategies are increasingly driven by data analytics, personalisation, and automation, allowing businesses to engage with customers in a more targeted and efficient manner (Benitez et al., 2020a). AI technologies enable businesses to analyse customer behaviours, preferences, and feedback in real time, thus tailoring communication, promotions, and support to each customer's unique needs.

Effective engagement strategies often include personalised marketing, proactive customer service, and multi-channel communication. For example, AI-powered systems can automatically send personalised emails, recommend products based on past purchases, or engage with customers via chatbots on social media platforms (Braojos et al., 2020). By creating relevant and timely touchpoints, businesses can boost customer satisfaction, encourage repeat business, and reduce churn (Foltean et al., 2019).

For small and medium-sized enterprises (SMEs), implementing AI-driven engagement strategies can significantly improve their customer relationships while maintaining operational efficiency (Ghasemaghaei & Calic, 2020). With limited resources, SMEs benefit from automation and personalisation tools that enable them to engage with customers at scale without sacrificing the quality of interactions (Ghasemaghaei et al., 2017). As customers expect increasingly personalised and timely interactions, businesses that adopt AI-enhanced engagement strategies are better positioned to build stronger relationships and achieve sustainable growth in a competitive market (Fosso Wamba, 2022; Trainor et al, 2014).

Sales Optimisation

Sales optimisation refers to the use of strategies, tools, and technologies to maximise sales performance, increase revenue, and improve customer satisfaction. In the context of AI-driven customer relationship management (CRM), sales optimisation involves leveraging artificial intelligence to streamline sales processes, enhance decision-making, and deliver personalised solutions to customers (Benitez et al., 2022). AI-driven tools, such as predictive analytics, help businesses identify the most promising leads, forecast sales trends, and allocate resources more effectively, thereby improving overall sales efficiency. AI-powered CRM systems enable businesses to analyse large amounts of customer data, allowing sales teams to focus on high-potential opportunities, personalise their approach, and close deals faster (Braojos et al., 2020). For example, AI can automate lead scoring, helping sales teams prioritise prospects based on their likelihood to convert, which increases conversion rates and reduces time wasted on low-value leads (Foltean et al., 2019).

For small and medium-sized enterprises (SMEs), sales optimisation is crucial for staying competitive in the marketplace. By automating routine tasks and gaining actionable insights through AI, SMEs can optimise their sales strategies, minimise costs, and improve customer retention (Ghasemaghaei & Calic, 2020). Additionally, AI-enhanced sales optimisation enables businesses to personalise their sales pitches and identify cross-selling or upselling opportunities, further driving revenue growth (Ghasemaghaei et al., 2017).
With the growing importance of data-driven decision-making in sales, adopting AI-driven sales optimisation strategies is essential for businesses aiming to enhance performance, achieve sustainable growth, and maintain a competitive edge in today's dynamic market (Fosso Wamba, 2022; Wang et al, 2012).

Underpinning Theory for the Study

This study integrates the Resource-Based View (RBV) with the Technology Acceptance Model (TAM) to form the underpinning theory for this study. The Resource-Based View (RBV) asserts that a firm's competitive advantage and superior performance are driven by its unique, valuable, rare, and difficult-to-imitate resources (Barney, 1991). In AI-driven customer relationship management (CRM), technologies such as predictive analytics, customer data management, and interaction automation serve as strategic resources that enhance CRM capabilities. These AI tools enable businesses to better understand customer needs, optimise operations, and deliver personalised services, which in turn boosts customer satisfaction and supports growth (Teece, Pisano, & Shuen, 1997). For SMEs, effectively leveraging AI can provide a crucial competitive advantage and promote sustainable development despite resource limitations (Pillai & Kumar, 2020). The Technology Acceptance Model (TAM) complements RBV by explaining how and why individuals and organisations adopt new technologies based on perceived ease of use and usefulness (Davis, 1989). In the context of AI-driven CRM, TAM helps to understand how Nigerian SMEs perceive and adopt these technologies. When SMEs find AI solutions to be both useful and easy to implement, they are more likely to integrate them effectively (Venkatesh & Davis, 2000). Integrating RBV with TAM provides a comprehensive framework for examining how AI-driven CRM practices can enhance SME performance, illustrating how strategic use of AI can improve efficiency, customer interactions, and overall sustainable growth.

Empirical Review

Chaudhuri, Chatterjee, Vrontis, and Chaudhuri (2022) explored how artificial intelligence (AI) dynamism influences the sustainability of businesses, with a focus on small and medium-sized enterprises (SMEs). The research also examined the role of technological and leadership support in moderating the relationship between AI adoption and

sustainability within manufacturing and production sectors. A theoretical model was created, drawing upon expectation disconfirmation theory (EDT), technology–trust–fit (TTF) theory, contingency theory, and existing literature. The model was evaluated through factor-based PLS-SEM analysis, using data collected from 343 SME managers. Results indicated that organizational, situational, technological, and individual factors significantly affected the implementation of AI for sustainability, with leadership and technological backing serving as moderating factors.

Li, Lin, Luo, and Luo (2023) explored the role of artificial intelligence (AI) in enhancing customer relationship management (CRM) performance within e-commerce enterprises. Despite the growing importance of AI in strengthening customer relationships, its influence on CRM capabilities and overall performance had not been fully examined. Their study, grounded in the IT-enabled organisational capabilities perspective, investigated how AI usage impacts CRM performance, with a focus on the mediating role of CRM capabilities. Data from 193 Chinese e-commerce enterprises were analysed, revealing that AI usage significantly boosts CRM performance. Moreover, CRM capabilities were found to positively mediate the relationship between AI usage and CRM performance. This research provides valuable theoretical insights and empirical support for e-commerce firms adopting AI technologies to improve CRM effectiveness.

Li and Xu (2022) conducted a study on AI-driven customer relationship management (CRM) for sustainable enterprise performance, highlighting how AI technologies are transforming CRM, particularly in the context of Industry 4.0. AI capabilities, such as real-time human interaction, decision-making predictions, and rapid data analysis, have significantly impacted CRM systems. In their research, they proposed an AI-CRM technology model built on system-level and process-level architectures, along with mathematical models to link inputs and outputs. Using primary data from surveys, the study found that customers are not only aware of AI-enabled CRM but are also loyal to

companies employing these technologies. The research concluded that AI-CRM has a positive effect on product quality, performance, and customer commitment.

Methodology

The study adopted a survey research design to investigate the impact of AI-driven customer relationship management (CRM) practices on the sustainable growth of small and medium-sized enterprises (SMEs) in Nigeria. The choice of this approach is based on the growing relevance of AI technologies in enhancing business performance and supporting sustainable growth. The study focused on SMEs across Nigeria, with a population of thirty-nine million, six hundred and fifty-four thousand, three hundred and eighty-five (39, 654, 385) SMEs as gotten from SMEDAN website. A sample of 450 respondents was selected using a random sampling technique to ensure a representative cross-section of SMEs. Data was collected through a field survey conducted from 2023 to 2024. This time frame allowed for a thorough examination of the impact of various AI-driven CRM practices on SME growth. To maximise the effective use of time and resources, a structured questionnaire was employed as the primary data collection instrument. The questionnaire was divided into two main sections: the first section gathered socio-demographic information about the respondents, while the second section addressed AI-driven CRM practices, including customer data management, interaction automation, customer segmentation, predictive analytics, engagement strategies, and sales optimisation. The instrument used closed-ended questions rated on a five-point Likert scale (Strongly Disagree = 1, Disagree = 2, Undecided = 3, Agree = 4, Strongly Agree = 5) to assess the influence of these practices on sustainable business growth.

Validity and Reliability of the Research Instrument

The research instrument was rigorously validated to ensure its face and content validity. The validation process involved a thorough review by experts, including senior lecturers

and experienced practitioners in the field, who assessed the instrument's appropriateness and relevance for the study. To ensure reliability, a pilot survey was conducted with thirty respondents, constituting approximately 10 percent of the total sample size. This phase aimed to identify any ambiguities or poorly formulated questions. Feedback from the pilot survey was systematically analysed, leading to a refinement of the questionnaire to enhance clarity and accessibility for respondents. To measure the instrument's reliability and consistency, Cronbach's Alpha was utilised. The summary of the reliability coefficients is detailed in Table 1. The Cronbach's Alpha values for various variables ranged from 0.612 to 0.691, with an overall average Alpha of 0.645 across 35 items, indicating a satisfactory level of internal consistency. These statistics suggest that the research instrument is reliable for measuring the impact of AI-driven CRM practices on the sustainable growth of Nigerian SMEs.

Table 1: Summary of Cronbach's Alpha Reliability Coefficients

Variables	Cronbach's Alpha Co-efficient	Items
Customer Data Management	0.629	5
Interaction Automation	0.612	5
Customer Segmentation	0.655	5
Predictive Analytics	0.659	5
Engagement Strategies	0.632	5
Sales Optimisation	0.691	5
Sustainable Growth	0.623	5
Overall Average Alpha for the instrument (α)	**0.643**	**35**

Source: Researchers' Computation, 2024.

Model Specification

In this study, the model was specified to explore the relationship between AI-driven customer relationship management (AI-CRM) practices and the sustainable growth of Nigerian SMEs. The dependent variable is the sustainable growth of SMEs, which reflects the long-term success and development of these enterprises. The independent variable, AI-driven customer relationship management (AI-CRM) practices was proxied by several factors: customer data management (CDM), interaction automation (IA), customer segmentation (CS), predictive analytics (PA), engagement strategies (ES), and sales optimisation (SO). The model was functionally specified as follows:

$$SG = f(CDM, IA, CS, PA, ES, SO) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Econometrically, the model equation is stated as:

$$SG = \beta_0 + \beta_1 CDM + \beta_2 IA + \beta_3 CS + \beta_4 PA + \beta_5 ES + \beta_6 SO + \varepsilon \ldots\ldots\ldots\ldots 2$$

Where: β_0 = Constant; β_1 to β_6 = Coefficients of the independent variables;

CDM = Customer Data Management; IA = Interaction Automation; CS = Customer Segmentation; PA = Predictive Analytics; ES = Engagement Strategies; SO = Sales Optimisation and e = error term.

The **Apriori expectation** is stated as $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 and\ \beta_6 > 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$

This indicates that a unit increase in each AI-driven CRM practice (i.e., customer data management, interaction automation, customer segmentation, predictive analytics, engagement strategies, and sales optimisation) is anticipated to positively impact the sustainable growth of Nigerian SMEs.

The collected data were analysed using both descriptive and inferential statistical methods. A systematic coding process was employed to organise and prepare the data for analysis. Statistical tests were conducted at a significance level of 5 percent to determine the

relationships and effects of AI-driven CRM practices on the sustainable growth of Nigerian SMEs. The analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 24.0, ensuring robust and accurate statistical evaluation of the study's hypotheses and objectives.

Results and Discussion

Table 2 presents the mean, standard deviation, and Pearson's correlation coefficients for all variables in the study. The correlation statistics indicate that the variables—Customer Data Management (CDM), Interaction Automation (IA), Customer Segmentation (CS), Predictive Analytics (PA), Engagement Strategies (ES), and Sales Optimisation (SO)—are positively correlated with sustainable growth (SG) of Nigerian SMEs, with the exception of Engagement Strategies (ES), which shows a low correlation. These results suggest that most variables move in the same direction as SME growth, except for ES, which exhibits a weaker correlation. Additionally, multi-collinearity was not observed, as none of the correlation coefficients exceed the threshold of 0.8, as per Dwivedi's (2008) guidelines.

Table 2: Mean, Standard Deviation and Pearson's Correlation Coefficient for All Variables

Variables	Mean	Standard Deviation	SG	CDM	IA	CS	PA	ES	SO
SG	3.776	1.1174	1						
CDM	3.704	1.1298	0.758**	1					
IA	3.664	1.1666	0.733**	0.699**	1				
CS	3.926	1.0524	0.711**	0.702**	0.634**	1			
PA	3.758	1.1486	0.778**	0.753**	0.772**	0.791**	1		
ES	4.012	0.888	0.018	0.021	-0.048	0.073	0.010	1	

SO	3.87	0.9418	0.118*	0.092	-0.004	0.032	0.082	0.580**	1

Source: Researchers' computation based on the field survey 2024 using SPSS 24.0

Table 2 also shows the mean values for the six constructs of AI-driven CRM practices: Customer Data Management (CDM), Interaction Automation (IA), Customer Segmentation (CS), Predictive Analytics (PA), Engagement Strategies (ES), and Sales Optimisation (SO). The data shows that SMEs emphasised *Engagement Strategies* the most (mean = 4.012; standard deviation = 0.888), followed by *Customer Segmentation* (mean = 3.926; standard deviation = 1.0524), *Customer Data Management* (mean = 3.704; standard deviation = 1.1298), *Predictive Analytics* (mean = 3.758; standard deviation = 1.1486), *Sales Optimisation* (mean = 3.87; standard deviation = 0.9418), and *Interaction Automation* (mean = 3.664; standard deviation = 1.1666).

Table 2 also presents the mean value of *sustainable growth* (SG), revealing a mean of 3.776. This suggests that SMEs in Nigeria exhibit above-average growth in sustainability when implementing AI-driven CRM practices, as the scale used a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

The mean scores indicate that Nigerian SMEs place a relatively high emphasis on Engagement Strategies and Customer Segmentation, which are key components of AI-driven CRM practices. Despite ES showing a weaker correlation with sustainable growth in Table 2, its high mean value suggests SMEs recognise its importance in customer relations. On the whole, the average score for sustainable growth (3.776) implies that Nigerian SMEs experience moderate to high growth when employing AI-driven CRM strategies.

Table 3: Regression Analysis Using Ordinary Least Square Estimation Technique

Model	Unstandardized Coefficients		t-Statistics	Probability Value	Hypotheses
	B	Standard Error			
(Constant)	1.427	0.901	1.583	0.114	Significant
CDM	0.272	0.041	6.665	0.000	Significant
IA	0.212	0.037	5.724	0.000	Significant
CS	0.164	0.041	3.978	0.000	Significant
PA	0.224	0.052	4.326	0.000	Significant
ES	0.064	0.043	1.483	0.139	Insignificant
SO	0.124	0.042	2.985	0.003	Significant
R=0.841[a]; R Square=0.708; Adjusted R Square=0.704; Standard Error of the Estimate= 2.083; F-Stat = 179.082; Durbin-Watson = 2.098					

Source: Researchers' computation based on the field survey 2024 using SPSS version 24.

Table 3 presents the results of the regression analysis using the Ordinary Least Squares (OLS) estimation technique. The correlation coefficient (R = 0.841), indicates that the independent variables are strongly correlated with sustainable growth in Nigerian SMEs. The coefficient of determination (R^2 = 0.708) suggests that approximately 71 per cent of the systematic variations in sustainable growth can be explained by the sub-independent variables. After adjusting for the degrees of freedom, the adjusted R^2 value of 0.704 confirms that over 70 per cent of the variations in SME growth are accounted for by the independent variables. The remaining 30 per cent of the variations can be attributed to other factors outside the model or error term. The overall significance of the model, measured by the F-statistic (F = 179.082), demonstrates that the model is highly statistically significant at a 5 per cent significance level. Additionally, the standard error of the estimate is 2.083, which indicates that the regression model fits the data well. Each independent variable shows varying levels of statistical significance in explaining sustainable growth.

Customer Data Management (CDM) (t = 6.665, p = 0.000), Interaction Automation (IA) (t = 5.724, p = 0.000), Customer Segmentation (CS) (t = 3.978, p = 0.000), Predictive Analytics (PA) (t = 4.326, p = 0.000), and Sales Optimisation (SO) (t = 2.985, p = 0.003) are all significant predictors of sustainable growth. Engagement Strategies (ES), however, is not statistically significant (t = 1.483, p = 0.139), indicating it has a minimal impact on SME growth. Lastly, the Durbin-Watson statistic of 2.098 suggests that there is no significant presence of serial correlation in the residuals, confirming the robustness of the regression model.

Discussion of Findings

Empirical evidence has been provided in this study on the relationship between AI-driven Customer Relationship Management (CRM) practices and the sustainable growth of Nigerian SMEs. These findings align with prior empirical studies, offering further support for AI's role in driving sustainable growth. The study found that Customer Data Management (CDM) has a positive and significant relationship with the sustainable growth of Nigerian SMEs and this corroborates findings from Chaudhuri et al. (2022), who noted the importance of technological support and leadership in AI adoption, where customer data management was a key organisational factor for achieving sustainability. Interaction Automation (IA) was also found to significantly influence SME growth and this is consistent with Li et al. (2023), who found that AI improves CRM performance by enhancing interaction automation, which strengthens customer relationships and organisational performance. Customer Segmentation (CS) exhibited a statistically significant relationship with sustainable growth and this aligns with Li and Xu's (2022) study, which highlights AI's ability to transform CRM through real-time analysis and customer segmentation, fostering loyalty and improved business performance. The study revealed that Predictive Analytics (PA) has a significant positive relationship with sustainable growth and this suggests that the use of AI-driven predictive analytics, which

helps SMEs anticipate customer needs and market trends, contributes significantly to their growth. This finding is supported by Li and Xu (2022), who emphasised that AI's predictive capabilities play a key role in transforming CRM systems and driving sustainable performance in businesses. In contrast to the other variables, Engagement Strategies (ES) were not found to have a statistically significant impact on sustainable growth. This finding suggests that, despite its potential importance, the engagement strategies employed by SMEs in this study do not significantly drive growth. Chaudhuri et al. (2022) also noted the role of situational factors, indicating that certain CRM practices, like engagement strategies, may require additional organisational support or adaptation to yield positive outcomes in specific contexts. The study also showed that Sales Optimisation (SO) has a significant positive relationship with SME growth, suggesting that optimising sales processes through AI-driven CRM can enhance SMEs' operational efficiency and long-term growth. This supports Li et al. (2023), who found that AI-driven CRM capabilities directly boost performance by streamlining processes such as sales optimisation.

Conclusion

This study examined the relationship between AI-driven customer relationship management (AI-CRM) practices and the sustainable growth of Nigerian SMEs. The findings show that customer data management, interaction automation, customer segmentation, predictive analytics, engagement strategies, and sales optimisation all contribute positively to sustainable growth. Customer data management plays a vital role in helping SMEs harness valuable insights from customer interactions, enabling them to make informed business decisions. Interaction automation facilitates efficient communication and reduces manual processes, enhancing overall customer experience. Similarly, customer segmentation allows SMEs to tailor their marketing efforts, ensuring that they effectively reach and engage their target audiences. Furthermore, predictive

analytics has proven to be a crucial tool in forecasting customer behaviour, enabling proactive business strategies that align with future market trends. Engagement strategies, by fostering meaningful customer interactions, help in building lasting relationships that drive loyalty and long-term success. Finally, sales optimisation ensures that SMEs maximise their revenue potential, improving both operational efficiency and customer satisfaction. In conclusion, the study underscores the importance of integrating AI-driven CRM practices for the sustainable growth of SMEs in Nigeria. SMEs that adopt and effectively implement these practices are likely to experience improved performance, competitiveness, and long-term success in a challenging business environment.

Recommendations

Based on our findings, the following recommendations were made:

1. Nigerian SMEs should invest in AI technologies for managing their customer data as this will enable them to gain deeper insights into customer behaviour and preferences, improving decision-making and fostering growth.
2. SMEs should integrate automated interaction systems to streamline communication processes. Automation can enhance customer service efficiency, reduce operational costs, and improve customer satisfaction, ultimately driving sustainable growth.
3. SMEs should utilise AI tools for effective customer segmentation as understanding distinct customer groups, can help them personalise their offerings, target specific markets, and increase engagement, resulting in better sales and customer loyalty.
4. Nigerian SMEs should incorporate predictive analytics to anticipate customer needs and market trends as this proactive approach will allow them to adapt strategies for future demand, staying competitive and relevant.
5. SMEs should focus on building robust engagement strategies powered by AI to maintain meaningful interactions with customers as active customer engagement fosters loyalty and contributes to long-term sustainable growth.

6. SMEs should refine their sales strategies and processes by embracing AI-driven sales optimisation tools thus enhancing revenue generation, increasing profitability and improving their business efficiency.

References

Abrokwah-Larbi, K., & Awuku-Larbi, Y. (2024). The impact of artificial intelligence in marketing on the performance of business organizations: evidence from SMEs in an emerging economy. *Journal of Entrepreneurship in Emerging Economies*, *16*(4), 1090-1117.

Agu, E. E., Iyelolu, T. V., Idemudia, C., & Ijomah, T. I. (2024). Exploring the relationship between sustainable business practices and increased brand loyalty. *International Journal of Management & Entrepreneurship Research*, *6*(8), 2463-2475.

Ahmeti, Y., Kalimashi, A., Ahmeti, A., & Ahmeti, S. (2024). Factors affecting sustainable growth rate and its impact on financial performance of Kosovo manufacturing companies. *Economic Studies*, *33*(4).

Amarasinghe, H. (2023). Transformative Power of AI in Customer Relationship Management (CRM): Potential Benefits, Pitfalls, and Best Practices for Modern Enterprises. *International Journal of Social Analytics*, *8*(8), 1-10.

Badawi, M. B., Awad, T. H., & El Fahham, I. M. (2022). Application of artificial intelligence for the prediction of plain journal bearings performance. *Alexandria Engineering Journal*, *61*(11), 9011-9029.

Bauer, C., Galvan, J. M., Hancock, T., Hunter, G. K., Nelson, C. A., Riley, J., & Tanner, E. C. (2024). Integrating technology within the sales-service ecosystem: the emergent sales techno-ecosystem. *European Journal of Marketing*, *58*(3), 782-811.

Benitez, J., Arenas, A., Castillo, A., & Esteves, J. (2022). Impact of digital leadership capability on innovation performance: The role of platform digitization capability. *Information & Management*, *59*(2), 103590.

Benitez, J., Llorens, J., & Braojos, J. (2018a). How information technology influences opportunity exploration and exploitation firm's capabilities. *Information & Management*, *55*(4), 508-523.

Benitez, J., Ruiz, L., Castillo, A., & Llorens, J. (2020). How corporate social responsibility activities influence employer reputation: The role of social media capability. *Decision Support Systems*, *129*, 113223.

Bilgeri, N. (2020). *Artificial intelligence improving CRM, sales and customer experience: An analysis of an international B2B company* (Doctoral dissertation, FH Vorarlberg (Fachhochschule Vorarlberg)).

Braojos, J., Benitez, J., Llorens, J., & Ruiz, L. (2020). Impact of IT integration on the firm's knowledge absorption and desorption. *Information & Management*, *57*(7), 103290.

Brougham, D., & Haar, J. (2020). Technological disruption and employment: The influence on job insecurity and turnover intentions: A multi-country study. *Technological Forecasting and Social Change*, *161*, 120276.

Chandra, S., & Kumar, K. N. (2018). Exploring factors influencing organizational adoption of augmented reality in ecommerce: Empirical analysis using technology–organization–environment model. *Journal of Electronic Commerce Research*, *19*(3), 237-265.

Chatterjee, S., Chaudhuri, R., Vrontis, D., Thrassou, A., & Ghosh, S. K. (2021). Adoption of artificial intelligenceintegrated CRM systems in agile organizations in India. *Technological Forecasting and Social Change*, *168*, 120783.

Chaudhuri, R., Chatterjee, S., Vrontis, D., & Chaudhuri, S. (2022). Innovation in SMEs, AI dynamism, and sustainability: The current situation and way forward. *Sustainability*, *14*(19), 12760.

Dalla Pozza, I., Goetz, O., & Sahut, J. M. (2018). Implementation effects in the relationship between CRM and its performance. *Journal of Business Research*, *89*, 391-403.

Demlehner, Q., Schoemer, D., & Laumer, S. (2021). How can artificial intelligence enhance car manufacturing? A Delphi study-based identification and assessment of general use cases. *International Journal of Information Management*, *58*, 102317.

Di Vaio, A., Palladino, R., Hassan, R., & Escobar, O. (2020). Artificial intelligence and business models in the sustainable development goals perspective: A systematic literature review. *Journal of Business Research*, *121*, 283-314.

Ewuga, S. K., Egieya, Z. E., Omotosho, A., & Adegbite, A. O. (2023). Comparative review of technology integration in SMES: a tale of two economies-the United States and Nigeria. *Engineering Science & Technology Journal*, *4*(6), 555-570.

Foltean, F. S., Trif, S. M., & Tuleu, D. L. (2019). Customer relationship management capabilities and social media technology use: Consequences on firm performance. *Journal of Business Research*, *104*, 563-575.

Fosso Wamba, S. (2022). Impact of artificial intelligence assimilation on firm performance: The mediating effects of organizational agility and customer agility. *International Journal of Information Management*, *67*, 102544.

Ghasemaghaei, M., & Calic, G. (2020). Assessing the impact of big data on firm innovation performance: Big data is not always better data. *Journal of Business Research*, *108*, 147-162.

Ghasemaghaei, M., & Turel, O. (2021). Possible negative effects of big data on decision quality in firms: The role of knowledge hiding behaviours. *Information Systems Journal*, *31*(2), 268-293.

Ghasemaghaei, M., Hassanein, K., & Turel, O. (2017). Increasing firm agility through the use of data analytics: The role of fit. *Decision Support Systems*, *101*, 95-105.

Guerola-Navarro, V., Gil-Gomez, H., Oltra-Badenes, R., & Sendra-García, J. (2021). Customer relationship management and its impact on innovation: A literature review. *Journal of Business Research*, *129*, 83-87.

Haessler, P. (2020). Strategic decisions between short-term profit and sustainability. *Administrative Sciences*, *10*(3), 63.

Johnson, P. C., Laurell, C., Ots, M., & Sandström, C. (2022). Digital innovation and the effects of artificial intelligence on firms' research and development – Automation or augmentation, exploration or exploitation? *Technological Forecasting and Social Change*, *179*, 121636.

Khan, S., & Iqbal, M. (2020). AI-Powered Customer Service: Does it optimize customer experience?. In *2020 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions)(ICRITO)* (pp. 590-594). IEEE.

Komarek, A. M., De Pinto, A., & Smith, V. H. (2020). A review of types of risks in agriculture: What we know and what we need to know. *Agricultural Systems*, *178*, 102738.

Li, F., & Xu, G. (2022). AI-driven customer relationship management for sustainable enterprise performance. *Sustainable Energy Technologies and Assessments*, *52*, 102103.

Li, L. (2022). Digital transformation and sustainable performance: The moderating role of market turbulence. *Industrial Marketing Management*, *104*, 28-37.

Li, L., Lin, J., Luo, W., & Luo, X. R. (2023). Investigating the effect of artificial intelligence on customer relationship management performance in e-commerce enterprises. *Journal of Electronic Commerce Research*, *24*(1), 68-83.

Li, L., Lin, J., Ouyang, Y., & Luo, X. (2022). Evaluating the impact of big data analytics usage on the decision-making quality of organizations. *Technological Forecasting and Social Change*, *175*, 121355.

Li, Y., Huang, J., & Song, T. (2019). Examining business value of customer relationship management systems: IT usage and two-stage model perspectives. *Information & Management*, *56*(3), 392-402.

Miceli, A., Hagen, B., Riccardi, M. P., Sotti, F., & Settembre-Blundo, D. (2021). Thriving, not just surviving in changing times: How sustainability, agility and digitalization intertwine with organizational resilience. *Sustainability*, *13*(4), 2052.

Naslednikov, M. (2024). *The impact of artificial intelligence on customer relationship management (CRM) strategies* (Bachelor's thesis, Haaga-Helia University of Applied Sciences).

Olan, F., Ogiemwonyi Arakpogun, E., Suklan, J., Nakpodia, F., Damij, N., & Jayawickrama, U. (2022). Artificial intelligence and knowledge sharing: Contributing factors to organizational performance. *Journal of Business Research*, *145*, 605-615.

Rahman, M. S., Bag, S., Gupta, S., & Sivarajah, U. (2023). Technology readiness of B2B firms and AI-based customer relationship management capability for enhancing social sustainability performance. *Journal of Business Research*, *156*, 113525.

Rahman, M. S., Bag, S., Gupta, S., & Sivarajah, U. (2023). Technology readiness of B2B firms and AI-based customer relationship management capability for enhancing social sustainability performance. *Journal of Business Research*, *156*, 113525.

Rosário, A. T., Raimundo, R. J., & Cruz, S. P. (2022). Sustainable entrepreneurship: A literature review. *Sustainability*, *14*(9), 5556.

Sanchez-Planelles, J., Segarra-Oña, M., & Peiro-Signes, A. (2022). Identifying different sustainable practices to help companies to contribute to the sustainable development: Holistic sustainability, sustainable business and operations models. *Corporate Social Responsibility and Environmental Management*, *29*(4), 904-917.

Saura, J. R., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2021). Setting B2B digital marketing in artificial intelligence-based CRMs: A review and directions for future research. *Industrial Marketing Management*, *98*, 161-178.

Sheth, J. N., & Parvatiyar, A. (2021). Sustainable marketing: Market-driving, not market-driven. *Journal of macromarketing*, *41*(1), 150-165.

Shiro, A. A., & Abiola, O. O. (2023). Contribution of small and medium scale enterprises to economic development of Nigeria. *Nigerian Journal of Risk and Insurance*, *13*(2), 15-30.

Trainor, K. J., Andzulis, J., Rapp, A., & Agnihotri, R. (2014). Social media technology usage and customer relationship performance: A capabilities-based examination of social CRM. *Journal of Business Research*, *67*(6), 1201-1208.

Wang, D., Luo, X., Hua, Y., & Benitez, J. (2022). Big arena, small potatoes: A mixed-methods investigation of atmospheric cues in live-streaming e-commerce. *Decision Support Systems*, 113801.

Wang, S., Cavusoglu, H., & Deng, Z. (2016). Early mover advantage in e-commerce platforms with low entry barriers: The role of customer relationship management capabilities. *Information & Management*, *53*(2), 197-206.

Wang, Y., & Feng, H. (2012). Customer relationship management capabilities: Measurement, antecedents and consequences. *Management Decision*, *50*(1), 115-129.

Yang, W., Yu, J., & Li, K. (2023). Financial resource allocation, technological progress and high-quality economic development. *Frontiers of Economics in China*, *18*(4), 504-530.

Zhang, C., Wang, X., Cui, A. P., & Han, S. (2020). Linking big data analytical intelligence to customer relationship management performance. *Industrial Marketing Management*, *91*, 483-494.

Zhao, X., Pan, C., Cai, J., & Luo, X. R. (2021). Driving e-commerce brand attachment through green packaging: An empirical investigation. *Journal of Electronic Commerce Research*, *22*(3), 178-198.