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Artificial Intelligence and Customer Relationship Management (CRM) in Nigeria Telecommunication Sector

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ABSTRACT:
The increasing competitiveness of the telecommunications industry and rising customer expectations have compelled firms to adopt innovative technologies, such as AI, to enhance customer engagement. To empirically establish the above assertion, it becomes necessary to examine the impact of artificial intelligence (AI) on customer relationship management (CRM) in the Nigerian service sector, with particular focus on telecommunications firms in Port Harcourt Metropolis. The study adopts a survey research design, targeting employees and customers of selected telecommunications companies in Port Harcourt. Analytically, descriptive and inferential statistical techniques were employed. The findings reveal that AI significantly improves CRM effectiveness by enabling real-time customer support, enhancing service personalization, and predicting customer behaviour, including churn tendencies. Therefore, the study recommends increased investment in AI technologies, staff training, and supportive regulatory frameworks to maximize the benefits of AI in customer relationship management. It also suggests that telecom firms should leverage AI for predictive analytics and personalized marketing strategies to remain competitive in a dynamic business environment.

KEYWORDS: *Artificial intelligence, Customer, and Relationship Management.*

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INTRODUCTION

The rapid advancement of Artificial Intelligence has significantly transformed business operations across industries, particularly in the service sector, where customer interaction is central to organizational success. Artificial intelligence refers to the use of machine learning, data analytics, and intelligent systems to simulate human decision-making and improve the efficiency of organizational processes (Amarasinghe, 2023). In recent years, businesses have increasingly integrated AI into marketing and customer service functions to enhance responsiveness, personalization, and overall service delivery.

One key area undergoing this transformation is Customer Relationship Management (CRM), which involves strategies and technologies that firms use to manage customer interactions, improve satisfaction, and foster long-term loyalty (Wang & Feng, 2022). Traditionally, CRM systems relied on manual processes and basic data storage, limiting their ability to deliver real-time insights and personalized customer experiences. However, integrating AI into CRM has enabled advanced capabilities such as predictive analytics, automated customer support, and data-driven decision-making, thereby improving customer engagement and retention.

In the highly competitive, customer-driven telecommunications sector, the application of AI in CRM has become increasingly important. Telecommunication firms manage millions of subscribers and vast amounts of customer data, making efficient customer relationship management a critical success factor. AI-powered CRM systems enable telecommunications companies to analyze customer behaviour, predict churn, and provide personalized services through tools such as chatbots and virtual assistants (Johnson et al., 2022). These technologies help firms enhance customer satisfaction, reduce operational costs, and improve service

efficiency. For instance, AI enables telecom operators to deliver personalized support, automate responses to customer inquiries, and predict customer needs, thereby improving overall customer experience and loyalty.

Furthermore, AI-driven CRM systems allow telecom firms to shift from reactive to proactive customer management by identifying potential service issues and resolving them before they escalate (Dwivedi et al., 2021). They also support real-time analytics, enabling firms to make informed marketing and service decisions. Studies (Dalla et al., 20218; Demlehner, 2021; Ghasemaghaei & Calic, 2020) have shown that AI applications, such as churn prediction and automated customer support, significantly improve customer retention rates and operational performance in telecommunications. This is particularly important in an industry characterized by high customer turnover and intense competition, where retaining existing customers is more cost-effective than acquiring new ones.

In Nigeria, the telecommunication industry plays a vital role in economic development and digital transformation, providing essential communication services and supporting sectors such as banking, e-commerce, and mobile payments. However, the industry faces several challenges, including poor service quality, customer dissatisfaction, network issues, and increasing competition among service providers. Additionally, the rise in digital services has heightened customer expectations for faster, more personalized, and more efficient service delivery.

Despite the global adoption of AI in CRM, its implementation in the Nigerian service sector, particularly among telecommunications firms in Port Harcourt Metropolis, is still evolving. Many organizations are yet to fully harness the potential of AI technologies due to factors such as high implementation costs, inadequate technical expertise, data privacy concerns, and infrastructural limitations. At the same time, the increasing incidence of cyber-related risks and fraud in the telecom sector further emphasizes the need for intelligent systems capable of detecting and preventing such threats while maintaining customer trust (Verhoef et al., 2021).

Port Harcourt Metropolis, as a major economic hub in Nigeria, hosts several telecommunications firms, including MTN, Globacom, AIRTEL, 9mobile, and Starcomms, that serve a large and diverse customer base. The growing demand for efficient and reliable telecommunications services in the area underscores the importance of adopting innovative technologies, such as AI, to improve customer relationship management. The adoption of artificial intelligence by telecommunication firms operating in Europe, such as Vodafone, T-Mobile, Verizon Communications, Deutsche Telekom, and BT Group, has significantly improved customer relationship management, enhanced customer satisfaction, reduced operational costs, and increased customer retention (Chatterjee et al., 2021).

The above telecommunication firms effectively manage customer relationships through chatbots, personalized recommendations, churn prediction, sentiment analysis, intelligent call routing, and proactive support services. These applications help companies deliver superior customer experiences, increase customer retention, improve operational efficiency, and gain a competitive advantage in the telecommunications industry. In recent years, Artificial Intelligence (AI) has emerged as a transformative technology with the potential to enhance CRM practices through automation, predictive analytics, personalized customer interactions, and real-time service delivery. AI-powered tools such as chatbots, recommendation systems, and data analytics platforms are designed to improve customer engagement and operational efficiency.

Despite significant investments in CRM systems, many telecommunications companies in Port Harcourt Metropolis continue to face challenges, including poor customer service delivery, delayed responses to customer complaints, low customer retention, and decline in customer loyalty. The low adoption of AI in customer relationship management by telecommunication firms operating in less developed countries has negatively affected effective customer relationship management, leading to reduced customer satisfaction, increased operational costs, limited-service personalization, and weakened competitiveness. Also, many firms may face challenges such as inadequate technological infrastructure, high implementation costs, limited skilled personnel, data privacy concerns, and resistance to change, all of which may hinder the effective deployment of AI-driven CRM systems. It is therefore necessary to investigate the role of artificial intelligence in enhancing customer relationship management in the Nigerian service sector, with a specific focus on telecommunications firms in Port Harcourt Metropolis. Hence, this study seeks to fill this gap by examining the impact of interactive automated responses on customer satisfaction of telecommunication firms in Port Harcourt Metropolis, determining the impact of predictive analytics on customer retention of telecommunication firms in Port Harcourt Metropolis, and evaluating the impact of customer data management on customer loyalty of telecommunication firms in Port Harcourt Metropolis.

LITERATURE REVIEW

The integration of Artificial Intelligence (AI) into Customer Relationship Management (CRM), especially among telecommunication firms, has significantly transformed how telecommunication firms manage

customer interactions, analyze customer behavior, and utilize customer information for strategic decision-making. Empirical studies such as Al-Homery et al. (2023), Meena and Sahu (2022), Soltani et al. (2016), and Zulyanti and Irawan (2023) indicate that AI-driven CRM practices improve customer satisfaction, retention, loyalty, and organizational performance by enhancing interaction automation, predictive analytics, and customer data management. Interaction automation, an aspect of customer relationship management, refers to the use of AI technologies such as chatbots, virtual assistants, natural language processing (NLP), and automated response systems to manage customer interactions. 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 human intervention (Fosso Wamba, 2022). By automating repetitive interactions, businesses can provide faster, more consistent responses, enhancing customer experience and improving operational efficiency.

Empirical evidence from Nugraha et al. (2024), Farooqi & Raza (2022), and Meena and Sahu (2021) shows that AI-powered automation improves service efficiency by providing instant responses, reducing waiting times, and ensuring 24-hour customer support. Organizations adopting AI-driven interaction automation report higher levels of customer engagement and satisfaction because customers receive faster, more personalized service. In sectors such as telecommunications, banking, and retail, automated customer service systems have been found to reduce operational costs while improving customer retention rates. Furthermore, empirical studies (Badawi et al., 2022; Brougham, D., & Haar, 2020; Chatterjee et al., 2021; Johnson et al., 2022) reveal that intelligent chatbots and virtual assistants enhance CRM effectiveness by handling routine inquiries, allowing customer service representatives to focus on more complex customer issues. This improves relationship quality and strengthens customer loyalty. In AI-driven customer relationship management (CRM), interaction automation enables organizations to manage high volumes of customer queries seamlessly, ensuring 24/7 availability and reducing response times (Benitez et al., 2020). Automated interactions also enable personalization, as AI systems can analyze customer data in real time to offer tailored 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 advances in AI, making it a key component of modern business strategies aimed at improving customer engagement, satisfaction, and loyalty (Benitez et al., 2022).

Predictive analytics is one of the most influential AI applications in CRM. It also refers to the use of statistical techniques, machine learning algorithms, and data mining to analyze historical data and forecast future customer behaviours, trends, and outcomes (Awan et al., 2021). It utilizes machine learning algorithms and historical customer data to forecast future customer behaviors, purchasing patterns, and churn tendencies. In the realm of AI-driven customer relationship management (CRM), predictive analytics allow businesses to anticipate customer needs, personalize offerings, and optimize 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 analyzing 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 offer a competitive edge by allowing them to optimize resource allocation, minimize 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 personalized 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, integrating predictive analytics into CRM systems is essential for businesses seeking to maintain relevance and competitiveness (Chatterjee et al., 2021).

Empirical findings of Fernando et al. (2023) and Zulyanti and Irawan (2023) demonstrate that predictive analytics enables firms to identify high-value customers, anticipate customer needs, and implement proactive retention strategies. Organizations using predictive analytics in CRM have reported significant improvements in customer satisfaction, customer lifetime value, and marketing effectiveness (Choudhury, et al., 2022). Research further indicates that predictive models support real-time decision-making by helping

firms personalize product recommendations, target promotions more accurately, and identify customers at risk of defection. These capabilities contribute to stronger customer relationships and increased profitability. Predictive analytics also assists managers in allocating resources efficiently and optimizing marketing campaigns based on customer behavior forecasts.

Customer data management involves collecting, integrating, storing, and analyzing customer information across multiple touchpoints (Chatterjee et al., 2024). AI enhances CRM by processing large volumes of structured and unstructured customer data to generate actionable insights. In the context of AI-driven customer relationship management (CRM), customer data management involves using advanced technologies such as machine learning and data analytics to process large volumes of customer data and derive valuable insights that inform personalized 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). As businesses increasingly move towards digital transformation, customer data management is becoming a critical component for sustaining long-term success, enhancing decision-making, and enabling a more targeted and efficient approach to customer engagement (Benitez et al., 2018).

Empirical studies (Payne & Frow, 2017; Dwivedi, et al. 2021; Fosso-Wamba et al., 2022) suggest that effective customer data management enables organizations to develop a comprehensive view of customer preferences, behaviors, and expectations. This facilitates personalized communication and targeted marketing strategies. Research has shown that AI-powered data integration reduces information silos and improves data quality, allowing firms to make more accurate customer-related decisions. Organizations that effectively manage customer data through AI-enhanced CRM systems experience improved customer engagement, stronger customer loyalty, and better business performance. However, empirical studies also emphasize the importance of data governance, privacy protection, and ethical data usage in maximizing the benefits of AI-enabled CRM systems.

Nigeria's Telecommunication Sector and the Future of Artificial Intelligence (AI)

Nigeria's telecommunications sector is one of the most important drivers of the country's digital economy. With over two decades of liberalization and rapid expansion, the sector has become a foundation for digital services, financial technology, e-commerce, and internet connectivity. The emergence of Artificial Intelligence (AI) presents a significant opportunity to further transform the industry through enhanced network management, customer service automation, predictive analytics, and cybersecurity solutions (Diton & Odu, 2025; Choudhury et al., 2021; Awan et al., 2021). Telecommunication operators in Nigeria are gradually integrating AI technologies into their operations. AI applications are increasingly being utilized for network optimization, predictive maintenance, fraud detection, customer relationship management, and service personalization. Studies (Zanouda et al., 2021; Ouyang et al., 2021; Fosso Wamba et al., 2022) indicate that while awareness of AI among major telecom operators such as MTN and Airtel is relatively high, actual adoption remains moderate due to infrastructure limitations, implementation costs, and shortages of skilled personnel.

According to the Nigerian Communications Commission (NCC), AI and the Internet of Things (IoT) are critical technologies for enhancing business efficiency, stimulating innovation, and supporting Nigeria's ambition of developing a trillion-dollar digital economy. The Commission emphasizes that resilient broadband infrastructure is essential for realizing the full benefits of AI-enabled telecommunications services (NCC Report, 2026). Recent industry surveys show increasing investment in AI across global telecommunications firms. Evidence indicates that AI-driven automation is becoming central to network operations, with telecom operators reporting improvements in revenue generation, cost reduction, and service delivery. Many operators are also exploring generative AI applications for customer support and operational efficiency. Empirical research on Nigeria's wireless communication sector found that AI can significantly improve network optimization, predictive maintenance, and security management (Johnson et al., 2022; Rahman & Khan, 2023; Diton, G., & Odu, 2023). However, adoption is constrained by inadequate digital infrastructure, high implementation costs, weak governance frameworks, and limited technical expertise. The study recommends greater investment in broadband infrastructure, AI skills development, and supportive regulatory policies.

Owing to the rapid increase in the use of telecommunication services, the future of AI in Nigeria's telecom industry is promising. Industry experts project that AI deployment will move from pilot projects to large-scale implementation across telecommunications and other critical sectors (Dwivedi et al., 2021). Future AI applications are expected to include autonomous network management, intelligent customer experience systems, real-time traffic optimization, predictive fault detection, and AI-driven cybersecurity solutions (ATCON, 2026). Furthermore, increasing demand for data-intensive services, cloud computing, fintech

applications, and IoT devices is expected to accelerate telecom investment in AI technologies. AI-powered networks will become essential for managing complexity associated with expanding broadband penetration, 5G deployment, and future 6G technologies.

Furthermore, the future of Nigeria's telecommunications sector is closely linked to the successful adoption of Artificial Intelligence. AI has the potential to transform network operations, improve customer experience, enhance security, reduce operational costs, and create new revenue streams. However, achieving these benefits will require sustained investment in digital infrastructure, human capital development, regulatory reforms, and data governance frameworks. If these challenges are addressed, AI will become a major catalyst for the next phase of growth and innovation in Nigeria's telecommunications industry.

Underpinning Theory for the Study

This study adopts the Resource-Based View (RBV) as the underpinning theory. 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, optimize operations, and deliver personalized services, thereby boosting customer satisfaction and supporting growth (Teece et al., 1997). For SMEs, effectively leveraging AI can provide a crucial competitive advantage and promote sustainable development despite resource limitations (Pillai & Kumar, 2020). When SMEs find AI solutions both useful and easy to implement, they are more likely to integrate effectively (Venkatesh & Davis, 2000). Adopting RBV 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.

METHODOLOGY

This study adopts a descriptive survey research design. This design is appropriate because it allows systematic data collection from respondents to examine the relationship between artificial intelligence (AI) and customer relationship management (CRM) practices in telecommunication firms. The study was conducted in Port Harcourt Metropolis, Rivers State, Nigeria. The area is chosen for its high concentration of telecommunications firms and large customer base, making it suitable for examining AI-driven CRM practices.

The population consists of customers/subscribers of major telecommunications firms such as MTN Nigeria, Airtel Nigeria, and Globacom. A sample of 300 respondents was selected using a purposive sampling technique. Given the large population, the technique was considered appropriate because the study targeted individuals who have used telecommunication services for at least 6 years and possess adequate knowledge and experience in the subject under investigation. Hence, 150 respondents were selected from MTN Nigeria, which has the largest customer base in the study area; 75 from Airtel; and 75 from Globacom. Making it a total of 300 telecommunication subscribers.

A structured questionnaire was employed as the primary data collection instrument. The questionnaire was divided into two main sections: the first collected socio-demographic information about the respondents, while the second addressed AI adoption in customer relationship management. The questionnaire was structured so that each variable contained 5 items to address each research question. 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 how the use of artificial intelligence affects customer relationship management of telecommunication firms in Port Harcourt metropolis.

Model Specification

In this study, the model was specified to explore the impact of artificial intelligence on customer relationship management (CRM) practices. The dependent variable is customer relationship management, which reflects a firm's ability to attract and retain customers. The independent variable, the adoption of artificial intelligence, was proxied by interactive automated response (IAR), predictive analytics (PA), and customer data management (CDM). The model was functionally specified as follows:

CRM = (IAR, PA, CDM) --------1

Econometrically, the model equation is stated as:

$CRM = \beta 0 + \beta 1IAR + \beta 2PA + \beta 3CDM + \varepsilon$------2

Where: β0 = Constant; β1 … β4 = Coefficients of the independent variables; interactive automated response (IAR), predictive analytics (PA), customer data management (CDM) and e = error term.

Customer Relationship Management (CRM), the dependent variable, is measured by the frequency of customer repeat purchases of telecommunication services, which is a key determinant of customer satisfaction, loyalty, and retention.

The *a priori* expectation is stated as $\beta 1, \beta 2, \& \beta 3 >$ …… 0.

The collected data was analyzed using both descriptive and inferential statistical methods. The analysis was performed using Statistical Package for the Social Sciences (SPSS) version 24.0, ensuring a robust, accurate evaluation of the study's hypotheses and objectives.

RESULT AND DISCUSSIONS

Table 1 presents the descriptive statistics for all variables in the study. The correlation statistics indicate that the variables – interactive automated response (IAR), predictive analytics (PA), and customer data management (CDM) - are positively correlated with customer relationship management (CRM) among telecommunications firms operating in the Port Harcourt metropolis. These results suggest that most variables move in the same direction as customer relationship management. Additionally, multicollinearity was not observed, as none of the correlation coefficients exceeded 0.8, per Dwivedi's (2018) guidelines.

Table 1: Mean, Standard Deviation and Pearson's Correlation Coefficient for All Variables

Variables	Mean	Standard Deviation	IAR	PA	CDM
IAR	3.776	1.1174	1		
PA	3.704	1.1298	0.758**	1	
CDM	3.664	1.1666	0.733**	0.699**	1

Source: Researchers' computation based on the field survey 2026 using SPSS 24.0
Note: (***) highly statistically significant with $p < 0.001$

The data shows that telecommunication firms utilized interactive automated response the most (mean = 3.776; standard deviation = 1.174), followed by predictive analytics (mean = 3.704; standard deviation = 1.1298), and customer data management (mean = 3.664; standard deviation = 1.1666) in ensuring adequate customer relationship management through the use of Artificial Intelligence. The mean scores in the Table above indicate that telecommunication firms place a relatively high emphasis on interactive automated response (IAR) and predictive analytics (PA), which are key components of AI-driven CRM practices.

Table 2 presents the results of the Ordinary Least Squares (OLS) regression analysis. The correlation coefficient ($R = 0.841$) indicates that the independent variables are strongly correlated with customer relationship management of telecommunication firms. The coefficient of determination ($R^2 = 0.708$) suggests that 71% of the systematic variations in customer relationship management 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% of the variation in effective CRM is accounted for by the independent variables. The remaining 30% of the variation can be attributed to factors outside the model or to error terms. The overall significance of the model, as measured by the F-statistics ($F = 179.082$), is highly significant at the 5% 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) ($t = 3.978$, $p = 0.000$), Interactive Automation Responses (IAR) ($t = 6.665$, $p = 0.000$), and Predictive Analytics (PA) ($t = 5.724$, $p = 0.000$) are all significant predictors of Artificial Intelligence. Lastly, the Durbin-Watson statistics were 2.098, which is approximately equal to the ideal value of 2.0. i.e $DW \approx 2$ indicates no autocorrelation. This indicates the absence of significant serial correlation in the regression model's residuals. Therefore, the independence of errors underlying the Ordinary Least Squares (OLS) estimation technique is satisfied, confirming the robustness and reliability of the estimated regression results.

This study provides empirical evidence on the relationship between AI-driven Customer Relationship Management (CRM) practices and effective customer relationship management in telecommunication firms. These findings align with prior empirical studies, offering further support for AI's role in driving effective customer relationship management. The empirical analysis reveals that Interactive Automation Responses (IAR) have a positive and significant effect on the dependent variable ($\beta = 0.272$, $t = 6.665$, $p < 0.001$). This implies that a one-unit increase in innovation adoption is associated with a 0.272-unit increase in the outcome variable, holding other factors constant. The result suggests that organizations that actively adopt innovative technologies and practices tend to achieve better performance. This finding is consistent with the study by Fosso-Wamba and colleagues, which found that adopting emerging digital technologies significantly improves organizational efficiency and customer-related outcomes. Similarly, empirical

evidence from Agarwal and Prasad (2021) indicated that Interactive Automation Responses enhances organizational competitiveness and quality of service.

Table 2: Regression Analysis Using Ordinary Least Square Estimation Technique

Model	**Unstandardized Coefficients**	**Unstandardized Coefficients**	**t-Statistics**	**Probability Value**	**Hypotheses**
	B	**Standard Error**			
(Constant)	1.427	0.901	1.583	0.114	Significant
IAR	0.272	0.041	6.665	0.000	Significant
PA	0.212	0.037	5.724	0.000	Significant
CDM	0.164	0.041	3.978	0.000	Significant
R = 0.841a; R Square = 0.708; Adjusted R Square = 0.704; Standard Error of the Estimate = 2.083; F-Stat = 179.082; Durbin-Watson = 2.098	R = 0.841a; R Square = 0.708; Adjusted R Square = 0.704; Standard Error of the Estimate = 2.083; F-Stat = 179.082; Durbin-Watson = 2.098	R = 0.841a; R Square = 0.708; Adjusted R Square = 0.704; Standard Error of the Estimate = 2.083; F-Stat = 179.082; Durbin-Watson = 2.098	R = 0.841a; R Square = 0.708; Adjusted R Square = 0.704; Standard Error of the Estimate = 2.083; F-Stat = 179.082; Durbin-Watson = 2.098	R = 0.841a; R Square = 0.708; Adjusted R Square = 0.704; Standard Error of the Estimate = 2.083; F-Stat = 179.082; Durbin-Watson = 2.098	R = 0.841a; 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 2026 using SPSS version 26.

The results further show that Predictive Analytics (PA) has a positive, statistically significant effect on the dependent variable ($\beta = 0.212$, $t = 5.724$, $p < 0.001$). This indicates that increased adoption of Predictive Analytics processes significantly improves customer relationship management. The finding supports the argument that Predictive Analytics enhances efficiency, reduces service delivery time, minimizes human error, and improves customer satisfaction. This result aligns with the findings of Chatterjee et al. (2021), who reported that predictive analytics significantly improve organizational effectiveness and customer experience. Likewise, studies on artificial intelligence applications in customer relationship management have shown that Predictive Analytics contribute positively to service quality and customer retention.

The regression analysis also indicates that Customer Data Management (CDM) has a positive and significant effect on the dependent variable ($\beta = 0.164$, $t = 3.978$, $p < 0.001$). This suggests that effective collection, storage, analysis, and utilization of customer data contribute significantly to improved organizational customer retention. The result implies that firms that strategically manage customer information are better positioned to understand customer needs, personalize services, and strengthen customer relationships. This finding corroborates the work of Payne and Frow (2017), who emphasized that effective customer data management is central to successful customer relationship management initiatives. It also supports the findings of Ngai et al. (2020), who reported that data-driven customer management significantly improves customer satisfaction and loyalty.

CONCLUSION

Artificial Intelligence (AI) has become a transformative force in Customer Relationship Management (CRM), fundamentally reshaping how organizations interact with, understand, and serve their customers. By integrating AI-driven tools such as interactive automated responses, predictive analytics, and customer data management into CRM systems, businesses can move beyond traditional, reactive approaches toward more proactive, personalized, and data-driven strategies. The application of AI in CRM enhances customer experience through real-time engagement, accurate demand forecasting, and tailored service delivery. It

enables organizations to analyze vast amounts of customer data, uncover hidden patterns, and predict future behaviour, thereby improving decision-making and customer retention.

Additionally, AI-powered automation reduces operational costs and increases efficiency by handling repetitive tasks such as customer inquiries, data entry, and follow-ups. However, despite its numerous advantages, adopting AI in CRM is not without challenges. Issues such as data privacy concerns, high implementation costs, lack of technical expertise, and potential job displacement must be carefully managed (Demlehner et al., 2021). Organizations must also ensure ethical use of AI and maintain a balance between automation and human interaction to preserve trust and authenticity in customer relationships.

In conclusion, AI represents a significant advancement in CRM practices, offering organizations a competitive edge in an increasingly customer-centric marketplace. The adoption of AI tools, such as interactive automated responses, predictive analytics, and customer data management, in customer relationship management is determined by customer satisfaction, customer loyalty, and customer retention of telecommunication firms in Port Harcourt Metropolis. However, its successful implementation depends on strategic planning, investment in infrastructure and skills, and adherence to ethical standards. As technology continues to evolve, the synergy between AI and CRM will play a critical role in shaping the future of customer engagement and business sustainability.

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