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ARTIFICIAL INTELLIGENCE AND PREDICTIVE ANALYTICS IN SALES MANAGEMENT: ENHANCING FORECAST ACCURACY AND CUSTOMER TARGETING: A STUDY ON TELECOMMUNICATION FIRMS IN PORT HARCOURT

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Abstract
The study examined the influence of Artificial Intelligence and predictive analytics of sales management, in enhancing forecast accuracy and customer targeting within telecommunication firms operating in Port Harcourt. A quantitative survey design was employed and data were collected through administration of structured questionnaire. Respondents who were considered in the study consisted of employees operating in sales, marketing and analytics department of telecommunications firms. Data collected were analyzed using correlation and multiple regression analysis. Findings from our first model, revealed that Artificial Intelligence and predictive analytics significantly influences forecast accuracy ($\beta = .47$, $\beta = .31$, $p < 0.005$). Results from our second model, revealed that Artificial Intelligence and predictive analytics have a significant relationship with customer targeting ($\beta = .28$, $\beta = .42$, $p < .005$). Forecast accuracy and customer targeting also displayed a significant and positive relationship when factored with sales management performance. The study concludes that advanced analytical tools are not optional, but are essential for firms seeking to remain competitive. The study recommends among others that sales management teams should be encouraged to use forecasting results when making strategic planning in other to match market responsiveness.

Keywords: Artificial Intelligence, Predictive Analytics, Forecast Accuracy, Customer Targeting, Sales Performance.

Introduction

The rate at which digital technologies have taken over business environment has changed the manner with which firms operate. Customer perception and decision have improved due to tools like Artificial Intelligence and predictive analytics (Anastasios & Maria, 2024).

Competitive sectors such as telecommunications firms rely on technologies to forecast demand and target customers. According to Segun-Falade et al. (2024), technologies such as machine learning systems, algorithmic forecasting engines and intelligent customer tools are used to predict frequent changes in consumer behavior. Study has proven that sales management and operational performance rely on accurate market forecasting and customer targeting, because consumers' demand patterns are unstable due to several factors such as level of income, demographic factors etc. (Collica, 2017). Olan et al. (2022) argued that organizational learning has positively been influenced due to the use of Artificial Intelligence, and this has been achieved through self-data processing and its ability to make quality decisions.

It is evident that firms today face constant pressure from predicting customers' needs, and these pressures have made these firms react differently to the changes as they seek to improve sales performance. Furthermore, inaccurate forecasting, weak customer targeting, and the inconsistency in marketing strategies also affect sales performance (Olan et al., 2022). Despite increased adoption of digital technologies by these firms, it has been proven from literatures that most firms have not properly utilized this system. Therefore, the extent to which Artificial Intelligence and predictive analytics influence sales management has not been fully explored. However, few empirical studies on how Artificial Intelligence and predictive analytics influence forecast accuracy and customer targeting exist. Thus, Sofiyah et al. (2024) examine how Artificial Intelligence influences customer satisfaction. Their study revealed that dimensions such as chatbot and face recognition significantly influence customer satisfaction. Dubey et al. (2018) examined the role predictive analytics plays in enhancing marketing performance. Lawrence (2025) examined how demand forecasting accuracy influences customer satisfaction. Against this backdrop, a gap in literature exists; therefore, the study aims to investigate the role Artificial Intelligence and predictive analytics play in influencing forecast accuracy and customer targeting within telecommunication firms in Port Harcourt.

2.0 Literature Review

1) Theoretical Foundation

The Technology Acceptance Model (TAM) holds the view that the adoption of technology is as a result of perceived usefulness and perceived ease of use (Davis, 1989). Agreeably, this can be related to this study because Artificial Intelligence and predictive analytics have become powerful tools in predicting sales performance. Furthermore, firms have adopted these tools because of their ease of use and accuracy in predicting the consumers' future actions (Rahman & Ali, 2020). This theory is useful as it is relevant in influencing sales decisions.

The Resource-Based View (RBV) affirms that sustained competitive advantage arises from valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). Expanding our view, strategic resources that firms possess might be AI platforms, advanced analytical capabilities, and strong data infrastructure. Arguably, we can say that firms that develop these competencies are assured to achieve long-term performance, more targets, planning, and customer management outcomes (Sandeep & Lavanya, 2025).

Dynamic Capabilities Theory holds the view that being dynamic is a result of being able to sense, grasp, and reallocate resources in response to changes in our environment (Teece et al., 1997). Artificial Intelligence and predictive analytics help organizations to adjust to changes in human behaviour and business environment as consumers' tastes and preferences change over time; firms must try to detect these changes and allocate resources to remain competitive (Osei & Boateng, 2023). This theory suits the present study as telecommunication firms operate in an environment where speed and adaptability determine market success.

Artificial Intelligence

In contemporary times, it is evident that Artificial Intelligence (AI) has been applied to different industries and its applications have given positive feedbacks as well as negative feelings. The use of Artificial Intelligence has influenced data processing, pattern recognition and decision-making process of business. Furthermore, it has the ability to use machine learning algorithms which has helped to analyze different datasets in different sectors. Artificial Intelligence has been applied in sectors like healthcare, manufacturing, supply chain and marketing (Dixon et al., 2024). Artificial Intelligence in the healthcare sector is applied in order to predict electronic health records, imaging, and resource allocation, which has yielded positive results (Al-Nafjan et al., 2025). In management, Artificial Intelligence has also been used to determine a firm's operational efficiency. Majumder (2025) revealed that operational efficiency was achieved in their study through the use of automated routines task. In marketing, Artificial Intelligence has been used to predict customer satisfaction and loyalty, through variables like chatbots and face recognition (George & George, 2023). Furthermore, the use of chatbots also helps in addressing customers' complaints and discomfort because it responds promptly, and timely. Also, when it concerns customer service, patronage, and referrals, chatbots influences them positively (Yang et al., 2023; Nicolescu & Tudorache, 2022).

Predictive Analytics

The use of predictive analytics in understanding decision-making has proven to be helpful when forecasting future outcomes. Its ability to use historical data, statistical algorithms and machine learning has made this possible (Majumder, 2025). Predictive analytics has been conceptualized as the process of anticipating the unknowns from past events that are extracted from patterns (Bazzaz Abkenar et al., 2024). Moreover, its ability to combine Artificial Intelligence and big data has made it to produce accurate results over time. Predictive analytics was applied to healthcare sector, the data obtained from patients were used to predict their level of disease and how they respond to treatments (Dixon et al., 2024). Subsequently, other studies showed that machine learning also helps in forecasting stock market trend (Kumar & Manikandan, 2025). In marketing, this tool has been used to predict customer churn and retention strategies in order to reduce turnover rate (Omari et al., 2025 and Al-Omari et al., 2025).

Forecast Accuracy

Forecasting is an attempt to predict the future using quantitative and qualitative data. It has helped businesses to predict customer demand patterns overtime but without accuracy, it is like a waste of effort. No doubt, forecasting accuracy is very important as it ensures the reliability of models that are used in estimating future events. These events are predicted through the use of metrics like mean absolute error, mean square error, and mean absolute percentage error. Forecast accuracy has been proven to be efficient when related to supply chain optimization and financial planning (Hyndman & Koehler, 2006). Napoli et al. (2023), argued that Artificial Intelligence revealed a score of 95% when compared to traditional methods. Furthermore, when tested on advanced techniques, like ensemble learning and Artificial Intelligence, positive results were recorded due to their ability to use real-time information (Timmermann & Pal, 2025). However, accuracy of these models depends on the nature and quality of data used in predicting these models (Al-Nafjan et al., 2025). According to Siami-Namini et al. (2018), Artificial Intelligence is effective as it reduces uncertainty that might affect managerial judgment in respect to consumer's future demand when projecting sales.

Customer Targeting

Customer targeting refers to the strategic processes that firms use to identify, segment and select specific groups of consumers that might respond positively to marketing offerings. According to Huang & Rust (2021), the manner at which organizations identifies high value customers have changed due to the use of Artificial Intelligence in targeting customer. Wedel & Kannan (2016), revealed that machine learning algorithms predicted purchase intent, customer churn and lifetime value, through the use of data gathered on consumer purchase pattern. Furthermore, this model was also used to predict how consumers visit online and the time they spend on product page (De Keyser et al., 2023). Furthermore, the use of these models has changed the manner with which firms use to segment their target audience (Liu et al., 2022).

Empirical Review

Ghorban-Tanhaei et al. (2024), examined how predictive analytics influences customer behavior. The study aimed at examining how different machine learning algorithms play out when predicting consumer behavior. The study found that factors like purchase intent and personalized targeting increase customer engagement. The study further concluded that Artificial Intelligence influences targeting customers positively.

Okeleke et al. (2024) also examined how predictive analytics and Artificial Intelligence can be used to determine market trends. The study was carried out to examine how Artificial Intelligence can forecast consumer response in advertising campaigns. The study utilized empirical analysis, which used historical consumer data. The data collected were analyzed using the predictive model and machine learning. Findings from their study revealed that customers with over 85% accuracy are likely to have a high campaign rate.

Zulaikha et al. (2020) carried out a study on customer predictive analytics using Artificial Intelligence, which aimed to conduct an empirical study that would examine how Artificial

Intelligence can identify and target customers across their life-cycle phases. The study adopted a mixed empirical approach combining historical data analysis with Artificial Intelligence modeling. Findings from the study revealed that 85-92% accuracy in consumer behavior were predicted using Artificial Intelligence models. The study concluded that Artificial Intelligence as a predictive model can enhance individual knowledge when targeting.

Huang & Rust (2020) tried to use strategic framework to study Artificial Intelligence in marketing. The aim of the study was to empirically develop and test frameworks for using Artificial Intelligence in predictive analytics to forecast customer needs and personalized marketing. Longitudinal research design was adopted and data were analyzed using simulation test. Findings revealed that high level of engagement from consumer is a function of personalization.

Basson et al. (2019) examined Forecast accuracy in demand planning, a case study of fast-moving consumer goods. The objective of the study was to establish if demand planning interventions influence supply chain performance. The study used case study research design and data were collected through interviews from personnel who have knowledge on the demand planning process. Findings for the study revealed that forecasting accuracy influences supply chain performance.

Hypotheses

The following are the hypotheses formulated for the study:

H_{01}: Artificial Intelligence does not significantly relate to forecast accuracy.

H_{02}: Predictive analytics has no significant relationship with forecast accuracy.

H_{03}: Artificial Intelligence has no significant influence on customer targeting.

H_{04}: There is no significant relationship between predictive analytics and customer targeting.

H_{05}: Forecast accuracy and customer targeting do not have any significant influence on sales management performance.

3.0 Methodology

A quantitative survey design was used for the study. The population of the study consisted of the sales, marketing, and customer analytics employees of telecommunications firms. A self-administered instrument was used to collect data, which were analyzed using correlation and multiple regression analysis. The reliability test of the instrument was done using Cronbach's alpha, which was above 0.70.

Data Analysis and Interpretation

Respondent summary

Table 1: Respondent Summary by Gender and Age Group

Gender	25–34	35–44	45–54	55 and above	Total
Female	48	36	21	5	110
Male	57	42	26	8	133
Total	105	78	47	13	243

Source: Author's computation from field survey data (2025)

From Table 1, the sample of 243 respondents collected from telecommunications sales, marketing and analytics teams revealed that early and mid-career professionals are more in this sector. The highest numbers of respondent were 25–34 years, having a response rate 105, 35–44 years also revealed a response rate of 78. 45–54years had a total of 47 response rate and 55years and above had 13 responses. From the foregoing, it can be deduced that males were more than females. The highest participants in this study were males aged 25–34 (57) and females aged 25–34 (48).

Table 2 Correlation Analysis

Variables	AI	PA	FA	CT	SMP
AI	1	.62**	.58**	.54**	.49**
PA	.62**	1	.66**	.61**	.52**
FA	.58**	.66**	1	.57**	.63**
CT	.54**	.61**	.57**	1	.65**
SMP	.49**	.52**	.63**	.65**	1

From the result above in correlation analysis; Artificial Intelligence has a moderately strong and positive relationship with predictive analytics (r = .62). Artificial Intelligence also associates with forecast accuracy in a positive manner (r = .58) and customer targeting (r = .54). Furthermore, its relationship with sales and marketing performance was slightly weak (r = .49). From the results above, it can be said that Artificial Intelligence positively influences the variables understudied. Results from predictive analytics revealed stronger relationships. Its correlation with forecast accuracy is high (r = .66). When associated to customer targeting, it revealed a strong correlation (r = .61). The link with sales and marketing performance showed a stronger relationship (r = .52). Additionally, forecast accuracy revealed a strong positive relationship with performance (r = .63). The result proved that firms with better forecasting systems can make good decisions. Customer targeting when interconnected to performance also showed a positive and strong correlation (r = .65).

B. Test of Null Hypothesis

H_{01}: Artificial Intelligence does not significantly relate to forecast accuracy.
H_{02}: Predictive analytics has no significant relationship with forecast accuracy.

Table 3: Regression Model 1: Forecast Accuracy

Predictor	Beta (β)	t-value	Sig. (p)
AI	.31	4.52	.000
PA	.47	6.88	.000
R^2 **= .58**	**F-value** = 79.24	**Sig.** = .000	

From the results in the regression model 1, it can be deduced that Artificial Intelligence (AI) and predictive analytics (PA) have a positive and significant connection with forecast

accuracy. Supporting this, the result revealed a beta value of **β = .31** with a **t-value of 4.52 (p < .005)**, which indicates that Artificial Intelligence improves the accuracy of sales and market forecasts. Given this positive and statistical significance, we shall hence reject the first hypothesis (**H01)**, and agree that Artificial Intelligence has a significant positive relationship with forecast accuracy.

Furthermore, the regression table on Predictive analytics revealed a beta value of **β = .47** with a **t-value of 6.88 (p < .005)**. The result revealed that predictive analytics is a major driver of forecasting; this might be because of its role in identifying trends, modelling future demand, and reducing uncertainty in sales planning. Therefore, the second hypothesis (**H02)** will be rejected, and this indicates that predictive analytics significantly influences forecast accuracy. The **58% (R^2 = .58) variation from our model forecast accuracy** can be explained by Artificial Intelligence (AI) and predictive analytics (PA). The F-value of **79.24 with a p-value less than 0.005 (p < .005)** proves that the model is fit to predict this outcome.

C. Test of Null Hypothesis

H_{03}: Artificial Intelligence has no significant influence on customer targeting.

H_{04}: There is no significant relationship between predictive analytics and customer targeting.

Table 4: Regression Model 2: Customer Targeting

Predictor	Beta (β)	t-value	Sig. (p)
AI	.28	3.96	.000
PA	.42	6.11	.000
R^2 = .52	**F-value** = 63.18	**Sig.** = .000	

From the foregoing, it is evident from the model two (2) which revealed that Artificial Intelligence (AI) and predictive analytics (PA) influence how firms identify and target the right customers. A look at the table, Artificial Intelligence showed a beta coefficient of **β = .28** with a **t-value of 3.96 (p < .005)**. This indicates that Artificial Intelligence influences customer targeting efforts in a positive manner. From the result above, it becomes necessary to reject the third null hypothesis (**H03) and conclude that** Artificial Intelligence has a significant influence on customer targeting.

Accessing this relationship, predictive analytics showed a beta coefficient value of **β = .42** and a **t-value of 6.11 with a P-value < .005**. Given these results, it is arguable to say that predictive analytics help firms to understand purchase patterns, forecast customer behavior, and match products to the right segments. With these results, we therefore reject the fourth hypothesis (**H04)**. Thus, predictive analytics influences customer targeting decisions in a positive and significant manner. The model was found appropriate because it explains that **52% variation in customer targeting (R^2 = .52) can be accounted for by** Artificial Intelligence (AI) and predictive analytics (PA). Additionally, the F-statistic of **63.18 (p < .005)** confirms it all.

D. Test of Null Hypothesis

H_{05}: Forecast accuracy and customer targeting do not hold any significant influence on sales management performance.

Table 5: Regression Model 3: Sales Management Performance

Predictor	Beta (β)	t-value	Sig. (p)
FA	.36	5.04	.000
CT	.41	5.55	.000
R^2 = **.61**	**F-value** = 92.31	**Sig.** = .000	

Results from Regression Model 3 (Table 5) in respect to forecast accuracy and customer targeting when related to sales management performance records a beta value of **β = .36** with a **t-value of 5.04 (p < .005)**, indicating that sales management processes can be improved only when sales outcomes are predicted correctly. Furthermore, bringing customer targeting into the picture revealed a beta value of **β = .41** and a **t-value of 5.55 (p < .005)**. The result suggests that sales performance can improve when firms identify and approach the right customer. Also, as we can see, **61% variation** in sales management performance **(R^2 = .61)** can be accounted for by forecast accuracy and customer targeting. The authenticity of model was proven with F-value of **92.31 (p < .005)**. From the results above, it is necessary to reject the null hypothesis five **(H05). Therefore, it is conclusive** that forecast accuracy and customer targeting significantly influence sales management performance.

1) Discussion of Findings

The results from the study were traced back to literature support. The rejection of **the first hypothesis** showed that Artificial Intelligence influences forecast accuracy. This finding aligns with Chen and Sharma (2021), who argued that Artificial Intelligence can enhance day-to-day decision processes due to its ability to improve information, process, and interpret. The result above also led to the rejection of the second hypothesis. This reaches a conclusion that predictive analytics influences forecasting activities. In line with the findings were Okonkwo and Nweze (2022), who emphasized the importance of analytics in market decisions.

Driving further to customer targeting, the results above led to the rejection of the third and fourth hypotheses. Artificial Intelligence and predictive analytics revealed a positive and significant influence on customer targeting. This finding aligns with the work of Huang and Rust (2020) positing that Artificial Intelligence and predictive analytics have shaped customer segmentation from traditional activities which involve rigorous process. **The fifth hypothesis was** rejected because the result proved that forecast accuracy and customer targeting improve sales management performance.

2) **5.1 Conclusion**

The study examined the influence of Artificial Intelligence and predictive analytics on forecast accuracy and customer targeting. It was also checked if forecast accuracy and customer targeting have influences on sales management performance in telecommunication firms. The results revealed that Artificial Intelligence and predictive analytics influence

forecasting and customer targeting, this led to the rejection of **H01 to H04**. The rejection of **H05** revealed that good sales management performance can be acquired through forecast accuracy and customer targeting. In conclusion, advanced analytical tools are not optional but essential for firms seeking competitiveness.

II. 5.2 RECOMMENDATIONS

Based on the findings, the study recommends the following:

i. Telecommunication firms should invest more in predictive analytics tools, because these systems offer strong forecasting and customer profiling.
ii. Application of Artificial Intelligence should be encouraged when making real time decision regarding sales and customer management.
iii. Firms should train staff on how to use this system to achieve better results from it.
iv. Sales management teams should encourage the use of forecasting results when making strategic planning to match market responsiveness.

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