

Evaluating the Influence of Artificial Intelligence Marketing on Customer Satisfaction with Products and Services of Telecommunication Companies in Port Harcourt, Rivers State, Nigeria

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Abstract: *As e-commerce continues to grow in Nigeria, the use of artificial intelligence (AI) in marketing has become increasingly important. However, there is limited research on how AI marketing impacts customer satisfaction with products and services of telecommunication companies in Port Harcourt, Rivers State, Nigeria. This study aims to investigate the influence of AI marketing on customer satisfaction. The research design adopted for this study is quantitative, utilizing a cross-sectional survey method to collect data from customers of telecommunication companies in Port Harcourt. The sample size was determined using the Godden sample size formula, resulting in a sample size of 384. Data analysis involved the use of Pearson Moment Correlation Coefficient and SPSS spreadsheet for computation. The findings of this study indicate that AI personalization has a significant positive relationship with customer satisfaction, as evidenced by the significant positive correlation coefficients with repeat purchases and customer referrals. The results also show that the recommendation system has a significant positive relationship with repeat purchases and customer referrals. The implications of this study suggest that telecommunication companies in Port Harcourt can benefit from implementing AI marketing strategies, specifically AI personalization and recommendation systems, to enhance customer satisfaction, increase repeat purchases, and encourage customer referrals. Further research in this area is needed to explore the long-term effects of AI marketing on customer satisfaction and loyalty in the Nigerian telecommunication industry.*

Keywords: *AI marketing, customer satisfaction, telecommunication companies, AI personalization, recommendation system, repeat purchase, customer referral, service personalization, depersonalization.*

1.1 Introduction

A satisfied customer is an asset to a business because such a customer can advertise and bring other customers to the business through word-of-mouth referrals. Hence, customer satisfaction is a critical component of business success, particularly for companies operating in Nigeria's competitive and rapidly-evolving marketplace. It represents the extent to which a business meets or exceeds its customer's expectations, and has been linked to numerous positive outcomes, including improved customer loyalty, positive word-of-mouth, and enhanced financial performance. As such, ensuring high levels of customer satisfaction has become an essential priority for businesses in Nigeria mostly in the telecommunication industry. Franklin (2023)

defined customer satisfaction as a measure of how happy the customers of a particular business are with the product or service they offer.

In recent years, there has been growing recognition of the importance of customer satisfaction in Nigeria's business community. Nwachukwu and Maudlinepac (2022) in their study assert that if you make your customers happy and satisfied, they will be willing to part with their money on your service and product offerings. Also, Szyndlar (2023) warned that every business should treat customer satisfaction as a vital factor in the business and work seriously on its improvement.

Similarly, a study by Manyanga et al. (2022) highlighted that companies with high levels of customer satisfaction are more likely to achieve customer loyalty. Also, several other studies have shown that customer satisfaction is closely linked to customer experience, with businesses that invest in improving the customer experience consistently achieving higher levels of customer satisfaction. This indicates that companies in Nigeria that prioritize customer experience and satisfaction are better positioned to attract and retain customers.

But within the context of Nigeria, several telecommunication company customers are faced with numerous challenges that make them complain and grumble at either poor network performances or challenges with products and services offered by the operators. With the dynamism and innovation on the ground, artificial intelligence (AI) can be used to conveniently solve most of these problems and create customer satisfaction. Some examples of customer challenges in the telecommunications industry in Nigeria that can be addressed with artificial intelligence marketing are:

Network congestion: In Nigeria, customers often experience network congestion, which can lead to dropped calls and slow internet speeds. AI-powered network optimization can help telecom companies improve network performance and provide better connectivity for their customers (TS2 Space, 2023). According to TS2 Space (2023), AI is being utilized to analyze great amounts of data, which enables mobile networks to detect and adjust to changes in customer usage, network capacity, and network performance, which in turn helps in optimizing network performance, resulting in faster speeds and more reliable connections for customers.

Customer service: Customers in Nigeria may experience poor customer services, such as long wait times and unhelpful support. AI-powered chatbots can help customers in Nigeria resolve issues quickly and efficiently.

Data usage monitoring: Customers in Nigeria may have limited data plans and need to monitor their data usage to avoid overage charges. AI-powered data analytics can help customers in Nigeria track their data usage and provide recommendations on how to optimize their usage.

Personalized offers: Customers in Nigeria may not be aware of all the products and services offered by telecom companies. AI-powered recommendation systems can help customers discover new products and services that meet their needs (Raz, 2022).

Looking at these benefits of AI to the telecommunication industry in Nigeria, it is worthy to properly investigate empirically; the impact AI marketing practices have on customers'

satisfaction with the usage of products and services offered by telecommunication companies in Nigeria.

1.2 Statement of the Study

With the rise of e-commerce in Nigeria, the use of artificial intelligence (AI) in marketing has become increasingly necessary. However, there is limited research on how AI marketing impacts customer satisfaction with products and services of telecommunication companies in Port Harcourt. While AI has the potential to personalize customer experiences and enhance the overall online shopping experience, there are concerns that it may also depersonalize interactions and undermine customer trust. For example, several studies proved that AI personalization can improve customer satisfaction (Daqar & Smoudy, 2019; Ameen et al., 2021; Aguiar-Costa et al., 2022; Allen, 2022), however excessive personalization has been feared to lead to customers feeling intruded upon and uncomfortable (Demoulin & Willems, 2019; Boerman et al., 2017; Moore et al., 2015; Pappas et al., 2018; Haghirian et al. 2005).

Therefore, it is crucial to empirically investigate and understand the impact of AI marketing dimensions (such as AI personalization and recommendation system) on customer satisfaction variables (repeat purchase and referral) within the context of Port Harcourt, as this can inform strategies for improving the effectiveness and ethical use of AI in e-commerce, and ultimately enhance the customer satisfaction.

1.3 Aim and Objective of the Study

The study aims to investigate the influence of artificial intelligence marketing on customer satisfaction.

While it's specific objectives include to:

1. evaluate the extent AI personalization influences repeat purchase
2. investigate the extent AI personalization influences customer referral
3. investigate the extent recommendation system influences repeat purchase
4. evaluate the extent recommendation system influences customer referral.

1.4 Research Questions

The following research questions were addressed in the study:

1. To what extent does AI personalization influence repeat purchases?
2. To what extent does AI personalization influence customer referral?
3. What is the extent of influence the recommendation system has on repeat purchases?
4. To what extent does the recommendation system influence customer referral?

1.5 Research Hypotheses

The study formulated the following null hypotheses:

Ho₁: There is no significant relationship between AI personalization and repeat purchase.

Ho₂: There is no significant relationship between AI personalization and customer referral.

Ho₃: There is no significant relationship between the recommendation system and repeat purchases.

Ho₄: There is no significant relationship between the recommendation system and customer referral.

2.0 Review of Related Literature

2.1 Theoretical Review

The theoretical underpinning for the study of "Artificial Intelligence Marketing and Customer Satisfaction" is the Technology Acceptance Model (TAM) which was originally developed by Fred Davis in 1989. The TAM is a well-established theory that is commonly used to explain user behavior toward new technologies (Davis, 1989). It proposes that user acceptance of a technology depends on two primary factors: perceived usefulness and perceived ease of use.

In the context of AI marketing, the TAM could be used to explore how customers perceive AI-powered marketing tools, such as chatbots or recommendation engines. For instance, the study could examine how customers perceive the usefulness of these tools in helping them find the products they need, and how easy it is for them to interact with these tools.

2.2. Conceptual Framework

To empirically investigate the influence of artificial intelligence marketing on customer satisfaction, a conceptual framework to identify our predictor (independent) variable, and criterion (dependent) variable, was designed to give us a sense of direction. In this study, Artificial Intelligence Marketing (AIM) is the predictor variable, while Customers Satisfaction (CS) is the criterion variable. The independent variable has the following dimensions: AI Personalization and Recommendation System while the criterion variable was measured in terms of repeat purchases and referrals. (See Figure 1.1).

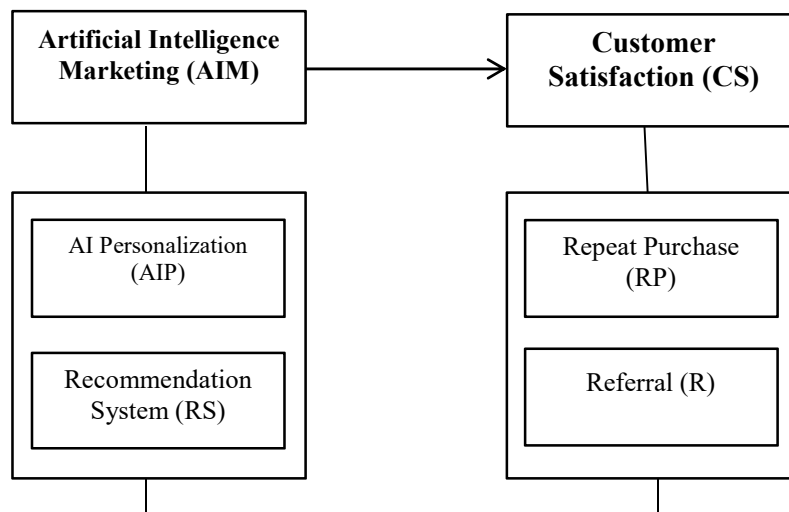


Figure 1.1: Conceptual Framework for Artificial Intelligence Marketing and Customer Satisfaction

Source: Researchers Conceptualization from Literature (2023).

2.3 Concept of Artificial Intelligence Marketing

Artificial Intelligence (AI) Marketing is a growing field that uses advanced technology to analyze data, automate processes, and make predictions to improve marketing strategies. The definition of AI Marketing varies among authors, and below are some of the explanations provided.

According to Marketing Evolution (2022), AI Marketing is the use of artificial intelligence technologies in making automated decisions that are based on data collection, analysis, and observations of audience or economic trends that might affect marketing efforts. Another definition of AI Marketing is provided by Tjepkema (2016), which saw it as the mechanism of leveraging customer data and artificial intelligence concepts like machine learning to anticipate a business customer's next move to improve the customer journey. Nwachukwu and Affen (2023a) defined AI marketing as the use of machine learning algorithms, natural language processing, and other AI technologies to personalize marketing messages, optimize campaigns, and improve customer engagement. In the same light, Jim Sterne in his book "Artificial Intelligence for Marketing," defines AI Marketing as "the use of advanced algorithms and data analytics to automate, personalize, and optimize marketing efforts in real-time, improving customer engagement and ultimately driving revenue growth" (Sterne, 2017).

AI-powered marketing has the potential to revolutionize the way businesses interact with their customers. AI algorithms can analyze vast amounts of data to identify patterns and insights that would be impossible to detect through human analysis alone. This data analysis can be used to develop personalized marketing campaigns that are tailored to each customer's preferences and behaviors (Verma et al., 2021). It can also be used to create personalized customer experiences. By analyzing customer data, businesses can gain insights into individual customer preferences and behaviors. This information can be used to develop personalized marketing campaigns that are tailored to each customer's needs and interests.

Artificial Intelligence (AI) marketing offers several benefits to businesses in Nigeria. These benefits include improved efficiency, personalized customer experiences, and better marketing campaign outcomes. One of the key advantages of AI marketing is improved efficiency. AI-powered tools such as chatbots and automated email campaigns can handle routine tasks, freeing up human marketers to focus on more complex tasks. This can lead to cost savings and higher productivity. Another benefit of AI marketing is the ability to deliver personalized customer experiences. AI-powered recommendation engines can analyze customer data and provide tailored product recommendations, while chatbots can provide personalized assistance to customers. AI marketing can help businesses achieve better marketing campaign outcomes. By analyzing customer data and predicting customer behavior, AI can help businesses target the right customers with the right message at the right time. This can lead to higher conversion rates and increased revenue (Picreel, 2023). Overall, AI marketing can help businesses in Nigeria improve their marketing efforts and achieve better business outcomes.

One way AI can help businesses in Nigeria achieve customer satisfaction is through the use of chatbots. Chatbots are automated customer service tools that can provide real-time assistance to customers 24/7. They can quickly and accurately respond to customer inquiries, resolve issues, and provide personalized recommendations. In doing so, chatbots can improve the speed and

efficiency of customer service, ultimately leading to higher levels of customer satisfaction. Another way AI can help businesses in Nigeria achieve customer satisfaction is through the use of predictive analytics. Predictive analytics is the use of AI algorithms to analyze customer data and make predictions about future customer behavior (Greengard, 2023). By understanding customer preferences, businesses can make informed decisions about product offerings, pricing strategies, and marketing campaigns.

2.4 Dimensions of Artificial Intelligence Marketing

Literature reviews on AI marketing have identified several dimensions of AI in marketing used by most authors in their study which includes personalization, recommendation systems, chatbots, predictive analytics, and customer segmentation. For personalization authors such as Duan et al. (2008), Pearson (2020), Lin (2022), Brenner (2019), and de Jesus (2019) all used personalization as the dimension of AI marketing.

Burke (2002), Chen et al. (2019), Zhang et al. (2021), and Khoali et al. (2020) have all cited recommendation systems as key dimensions of artificial intelligence marketing. In this study, we selected AI personalization and recommendation system as the dimensions of our predictor variable which is AI marketing because they can help businesses to provide a more tailored and personalized experience to customers; and by leveraging customer data and machine learning algorithms, AI-powered recommendation systems can suggest products or services that are likely to be of interest to individual customers, leading to increased customer satisfaction and loyalty.

2.4.1 Personalization:

These authors, including Duan et al. (2008), Pearson (2020), Lin (2022), Brenner (2019), and de Jesus (2019), have all cited personalization as a key dimension of artificial intelligence marketing in their respective publications. Personalization refers to the practice of tailoring content, products, and services to individual users based on their unique preferences, characteristics, and behavior. According to Salesforce (n.d.), personalization can be defined as a process of creating customized and relevant experiences for individuals by leveraging their data and behavior. Duan et al. (2008) describe personalization as "the tailoring of services and products to the individual needs of customers." They also note that personalization can be achieved through various means, including using customer data to generate recommendations and providing personalized offers and promotions. Lawton (2023) explains that personalization is an important aspect of marketing, as it allows companies to create more relevant and engaging experiences for their customers. They note that personalization can be achieved through various technologies, including recommendation systems and machine learning algorithms.

Personalization is an important aspect of AI marketing as it allows for the creation of more targeted and relevant marketing campaigns, which can lead to increased customer engagement and ultimately, higher sales. Personalization is an important opportunity and challenge for AI in marketing and discussed the different ways that AI can help personalize marketing communication to individual consumers based on their preferences, behavior, and demographics. It involves tailoring content, products, and services to meet the specific needs and preferences of individual customers. AI can be used to collect and analyze customer data, such as browsing history, purchase history, and social media activity, to provide personalized recommendations and offers.

2.4.2 Recommendation Systems:

These authors, including Burke (2002), Chen et al. (2019), Zhang et al. (2021), and Khoali et al. (2020) have all cited recommendation systems as a key dimension of artificial intelligence marketing in their respective publications. Recommendation systems are widely used in e-commerce and other industries to help personalize and improve the customer experience. By analyzing a user's past behavior and preferences, recommendation systems can suggest products or services that the user is more likely to be interested in, which can lead to increased customer satisfaction and loyalty.

A recommendation system is a type of artificial intelligence technology that provides personalized suggestions to users based on their preferences and behavior. According to Burke (2002), a recommendation system can be defined as a system that produces a list of recommendations in response to user requests. Nvidia (n.d.) define recommendation algorithms as a class of machine learning algorithms that provide personalized recommendations to users based on their past behaviors, interactions, and preferences. A personalized recommendation algorithm is based on association rules and machine learning. This algorithm analyzes a user's past behavior and makes recommendations based on patterns in the data.

Verhoef et al. (2020) examined the use of recommendation systems in multichannel customer management and found that personalized recommendations can increase customer engagement and sales. AI-powered recommendation systems are becoming increasingly popular in the telecommunication industry, and here are some examples of how they are being used:

Customer Retention: Telecom companies use AI-powered recommendation systems to identify customers who are at risk of leaving their service and provide personalized recommendations to retain them. These recommendations may include targeted discounts, loyalty rewards, or improved service plans based on the customer's usage and preferences.

Product and Service Recommendations: AI-powered recommendation systems can analyze customer usage data and provide personalized product and service recommendations based on the customer's needs and usage patterns. For example, a customer who frequently uses data services may receive recommendations for a higher data plan, while a customer who primarily makes calls may receive recommendations for a voice plan.

Network Optimization: AI-powered recommendation systems can analyze network performance data and provide recommendations for optimizing network performance and improving the customer experience. These recommendations may include network upgrades, service improvements, or adjustments to service plans to reduce network congestion.

Chatbots and Virtual Assistants: Telecom companies use AI-powered chatbots and virtual assistants to provide personalized customer service and support. These chatbots can analyze customer data and provide recommendations for resolving customer issues or answering customer questions.

Billing and Payment: AI-powered recommendation systems can analyze customer billing and payment data and provide personalized recommendations for managing bills, avoiding late payments, and reducing costs. These recommendations may include options for automatic payments, paperless billing, or other cost-saving measures.

Overall, AI-powered recommendation systems in the telecommunications industry are becoming increasingly sophisticated and can provide a range of benefits for both customers and telecom companies.

2.5 Concept of Customers Satisfaction

Customer satisfaction refers to the extent to which customers are satisfied with a product or service provided by a business. It is a key performance indicator that measures the level of happiness or contentment that customers feel toward a company's offerings. Customer satisfaction is important for businesses as it drives customer loyalty, improves brand reputation, and leads to repeat purchases, positive reviews, and referrals. Nwachukwu and Maudlinepac (2022) argued that a good pointer of better customer experience is the customer's show of satisfaction towards a brand or business offerings.

According to a study by Awolusi et al. (2018), customer satisfaction can be defined as the extent to which customer needs and expectations are fulfilled by the products or services provided by an organization. On the account of Gomachab and Maseke (2018 cited in Nwachukwu et al., 2022a), customer satisfaction could be seen as a measure of how the services provided or supplied by an organization meets or exceeds the expectations of a consumer.

The benefits of customer satisfaction to businesses in Nigeria are numerous. For one, satisfied customers are more likely to remain loyal to a company, which means they will continue to purchase its products or services. This, in turn, leads to increased revenue and profitability for the business. Additionally, satisfied customers are more likely to recommend the business to others, leading to new customers and increasing brand awareness. This assertion is been supported by a study carried out by Zhang et al. (2020) which found that satisfied customers are more likely to engage in positive word-of-mouth communication, which can lead to new customers and increased brand awareness.

Furthermore, customer satisfaction can lead to positive reviews and feedback, which can be used to improve the company's reputation and attract more customers (Kandampully & Zhang, 2015). In contrast, negative reviews and feedback can be detrimental to a company's reputation, leading to decreased customer trust and loyalty. Conclusively, customer satisfaction is a crucial aspect of any business, as it drives customer loyalty, improves brand reputation, and leads to increased revenue and profitability. Businesses in Nigeria require providing high-quality products and services that meet or exceed customer expectations to ensure long-term success. Several variables have served as indicators of customer satisfaction in most studies, and these will be discussed below.

2.6 Measure of Customer Satisfaction

Empirical indicators of customer satisfaction are measures used to assess customer satisfaction with a particular product, service, or experience. These measures are often used by businesses to identify areas of customer dissatisfaction and improve the overall customer experience. The following measurements are discussed below:

Customer satisfaction survey: This is a commonly used method to measure customer satisfaction. It involves asking customers to rate their satisfaction with a product or service on a scale. This method has been used by many businesses to assess customer satisfaction. For instance, Nwachukwu et al. (2022a) under this survey measured customer satisfaction using customer loyalty and word-of-mouth referral.

Complaints and feedback: The number of complaints received from customers and their feedback can also be used as an empirical indicator of customer satisfaction. The logic is that if customers are dissatisfied with a product or service, they are more likely to provide negative feedback or complaints. Therefore, monitoring the number and type of complaints received can help businesses identify areas of dissatisfaction and make necessary changes to improve customer satisfaction. This indicator has been used in many studies, including the study by Ali and Park (2018), which investigated the relationship between customer satisfaction and online reviews.

Repeat Purchase: The frequency at which customers return to a business to make additional purchases can also serve as an empirical indicator of customer satisfaction. If customers are satisfied with a product or service, they are more likely to make repeat purchases. This indicator has been used in many studies, including the study by Nwachukwu and Origbo (2022).

Referral: Referral by customers, also known as customer referrals, can be used as a measure of customer satisfaction in the business. The act of referring others indicates that customers are satisfied with their experience and are willing to advocate for the business. Authors such as Nwachukwu et al. (2022a); Nwachukwu and Origbo (2022) have all used referrals to measure customer satisfaction.

In this study, we measured customer satisfaction using repeat purchases and referrals because satisfied customers can repeat patronage with a brand and refer it to friends and relatives. These selected measures are discussed below.

2.6.1 Repeat patronage

Ikechi et al. (2021) assert that there is a popular adage in Igbo land in Nigeria which says that when a road is good, it is being repeatedly used by people, so also a product or services that satisfy consumers' needs and want will be repurchased by them when the need arises. Therefore, repeat purchasing happens when the customer is satisfied with the previous purchase of that product item (Nwachukwu et al., 2022b). Repeat patronage is a key indicator of customer loyalty and satisfaction. Businesses that have a high percentage of repeat customers tend to have higher revenue and profitability, as well as a more stable customer base.

Repeat patronage, also known as customer loyalty, refers to the likelihood or tendency of customers to continue purchasing products or services from a particular business or brand over an extended period. Nwachukwu and Affen (2023b) assert that repeat purchase simply means buying from a given business more than once. It can be viewed as a form of customer retention, and it is often seen as a desirable outcome for businesses because it can lead to higher profits, improved reputation, and reduced marketing costs (Fornell et al., 2016). Zeithaml et al. (1996) defined repeat patronage as "a deeply held commitment to rebuy or re-patronize a preferred product or service consistently in the future, thereby causing repetitive same-brand or same-brand-set purchasing,

despite situational influences and marketing efforts having the potential to cause switching behavior.

Customer repeat patronage, or customer loyalty, is highly beneficial for businesses in several ways. Here are some convincing benefits of customer repeat patronage:

Increased Revenue: Repeat customers are known to spend more over time. When customers develop loyalty toward a business, they are more likely to make repeat purchases and spend more on each transaction. This results in increased revenue for the business, as the lifetime value of a loyal customer tends to be higher than that of a one-time customer.

Cost-effective Marketing: Acquiring new customers can be expensive, as it involves advertising, promotions, and other marketing efforts. However, repeat customers require less marketing investment, as they are already familiar with the business and its offerings. Satisfied repeat customers also act as brand advocates and refer the business to others through word-of-mouth, which is a highly cost-effective form of marketing.

Higher Profits: Repeat customers tend to be less price-sensitive compared to new customers. They are willing to pay a premium for the quality, convenience, and trust they associate with the business. This allows businesses to command higher prices and margins, leading to higher profits.

Reduced Customer Churn: Repeat customers are less likely to switch to competitors, as they have already developed a relationship and trust with the business. This reduces customer churn, which is the rate at which customers stop doing business with a company. Reduced churn leads to higher customer retention rates and business stability.

Valuable Feedback and Insights: Repeat customers provide valuable feedback and insights that can help businesses improve their products, services, and overall customer experience. Their feedback can be used to make informed business decisions, identify areas of improvement, and tailor offerings to meet customer needs, resulting in increased customer satisfaction and loyalty.

Enhanced Brand Reputation: Repeat customers contribute to a positive brand reputation. Their loyalty and satisfaction translate into positive reviews, testimonials, and online ratings, which can influence other potential customers' purchase decisions. A strong brand reputation leads to increased trust, credibility, and a competitive edge in the market.

Opportunity for Upselling and Cross-selling: Repeat customers are more open to upselling and cross-selling, as they have already experienced the value of the business. This provides opportunities to offer additional products or services, resulting in increased sales and revenue without the need for acquiring new customers.

2.6.2 Referral

It refers to customers voluntarily recommending a business or its products/services to others based on their positive experience, without any formal referral program or incentives in place. The act of referring others indicates that customers are satisfied with their experience and are willing to advocate for the business. Askoy et al. (2011 cited in Nwachukwu & Origbo, 2022) argue that there are many reasons why consumers are motivated to engage in referral activity which a few

examples include (a) helping others, (b) sharing experiences and promoting self-concept, and (c) product involvement.

Helping others: Many consumers are motivated to engage in referral activity because they want to help others. They may have had a positive experience with a product or service and want to share that experience with their friends and family to help them make better purchasing decisions. Referring a product or service can also be seen as a way of doing a favor for someone else, which can be a powerful motivator for some consumers.

Sharing experiences and promoting self-concept: Consumers often engage in referral activity to share their experiences and promote their self-concept. By referring a product or service, consumers can demonstrate their knowledge and expertise to others, which can enhance their self-esteem and social status. Referring products or services that are perceived as high quality or prestigious can also enhance the consumer's self-concept and reputation.

Product involvement: Consumers who are highly involved with a particular product or service are more likely to engage in referral activity. This is because they have a greater level of knowledge and experience with the product or service, and are more likely to be passionate and enthusiastic about it. Consumers who are highly involved with a product or service may also have a greater sense of ownership and loyalty towards the brand, which can motivate them to refer it to others.

Other reasons why consumers engage in referral activity may include financial incentives, social norms, and a desire to reciprocate past referrals.

As a measure of customer satisfaction, customer referrals can be valuable for businesses in several ways:

Indicator of Customer Loyalty: When customers refer others to a business, it suggests that they have a high level of loyalty and trust in the business. Satisfied customers who are willing to refer others are more likely to repeat customers and provide long-term business.

Testimonial of Positive Experience: Customer referrals can serve as testimonials of positive experiences with a business. When customers refer others, they are essentially vouching for the business and its offerings, which can influence potential customers to trust the business.

Cost-effective Marketing: Customer referrals can be a cost-effective form of marketing, as they do not typically involve any direct costs or incentives. It can be an organic and sustainable way to generate new leads and customers, without incurring significant marketing expenses.

Potential for New Customer Acquisition: Customer referrals can lead to acquiring new customers who may have similar preferences and needs as the referring customer. Since referrals are based on personal recommendations, the conversion rate of referred customers may be higher compared to other marketing methods.

Feedback on Customer Experience: Customer referrals can also indirectly reflect the overall customer experience provided by a business. If customers are happy with their experience, they are more likely to refer others. On the other hand, a lack of referrals may indicate potential issues with customer satisfaction that need to be addressed.

2.7 Empirical Review on Artificial Intelligence Marketing and Customer Satisfaction

Several empirical reviews have been conducted on the impact of Artificial Intelligence Marketing and Customer Satisfaction. Some of the studies are discussed below.

The study by Ho and Chow (2023):

Ho and Chow (2022) investigated the influence of artificial intelligence on consumers' brand preference for retail banks in Hong Kong. The study adopted a quantitative research design method and structural equation modeling was utilized in analyzing 300 responses collected from a questionnaire survey of Generation Z subjects. The research findings prove that AI marketing efforts affected brand experience, brand preference, and repurchase intention.

The study by Noreen et al. (2023):

Noreen et al. (2023) study aims to investigate the consumer's perspective on artificial intelligence's adoption in Asian countries. The study used a quantitative research design and the questionnaire was designed and distributed to collect data from five Asian countries (China, Pakistan, Iran, Thailand, and Saudi Arabia,). The total useable responses were 799, and the findings of the study showed that the factors (attitude, awareness, perceived usefulness, subjective norms, and knowledge of artificial intelligence technology) had a significant and positive relationship with the intention to adopt AI in the banking sector.

The study by Zhao et al. (2023):

Zhao et al. (2023) study investigates how the unique characteristics of AI apps influence the task-technology fit and drive the intention of use. The study used an empirical research design, adopting the survey data and SEM method. The findings of the study showed that AI-enabled app positively affects the intention to use significantly.

Study by Al-Araj et al. (2022):

Al-Araj et al. (2022) conducted a study to investigate the effect of artificial intelligence on service quality and customer satisfaction in the Jordanian banking sector. The study adopted the survey research design method and used copies of questionnaire to gather data from 270 consumers in Jordan's banking sector. The SPSS program utilized exploratory factor analysis to statistically evaluate the sample data. The study found that artificial intelligence is statistically relevant to service quality and customer satisfaction.

The study by Chen et al. (2022):

Chen et al. (2022) empirically evaluated the influence of customer trust and artificial intelligence on customer engagement and loyalty – The case of the home-sharing industry. The study was conducted in China, with respondents who had used home-sharing platforms. Findings from structural equation modeling prove that AI may have a negative moderating effect between host trust and customer engagement.

The study by Ameen et al. (2021):

The study by Ameen et al. (2021) aims at analyzing how the integration of AI in shopping can lead to an improved AI-enabled customer experience. Using a survey research design, an online survey was distributed to customers who have used an AI-enabled service offered by a beauty brand. A total of 434 responses from the respondents were analyzed using partial least squares-structural

equation modeling. The study found a significant impact of artificial intelligence on customers' experience.

Table 2.1: Summary of the Empirical Literature Reviewed on Artificial Intelligence Marketing and Customer Satisfaction.

S/ N	Author (s)	Title of Work & Location	Methodology	Findings
1.	Ho and Chow (2022)	The influence of artificial intelligence on consumers' brand preference for retail banks in Hong Kong.	The study used a Quantitative research design method, and Structural Equation Modeling (SEM) to test the relationships between variables	The research findings prove that AI marketing efforts affected brand experience, brand preference, and repurchase intention.
2.	Noreen et al. (2023)	The consumer's perspective on artificial intelligence's adoption in Asian countries.	Quantitative research design.	Findings showed that the factors (attitude, awareness, perceived usefulness, subjective norms, and knowledge of artificial intelligence technology) had a significant and positive relationship with the intention to adopt AI in the banking sector.
3.	Zhao et al. (2023)	Is artificial intelligence attractive? An empirical study on users' intention to use AI-enabled applications.	Empirical research design, adopting the survey data and SEM method.	The findings of the study showed that AI-enabled app positively affects the intention to use significantly.
4.	Al-Araj et al. (2022)	The effect of artificial intelligence on service quality and customer satisfaction in the Jordanian banking sector.	Survey research design method, and exploratory factor analysis.	The study found that artificial intelligence is statistically relevant to service quality and customer satisfaction.
5.	Chen et al. (2022)	The influence of customer trust and artificial intelligence on customer engagement and loyalty – The case of the home-sharing industry.	Quantitative research design and survey method	Findings from structural equation modeling prove that AI may have a negative moderating effect between host trust and customer engagement.
6.	Ameen et al. (2021)	Customer experiences in the age of artificial intelligence.	Survey research design, partial least squares-structural equation modeling	The study found a significant impact of artificial intelligence on customers' experience.

Source: Literature Review (2023).

The empirical studies reviewed above all showed that AI marketing has significant positive impacts on customer satisfaction. To develop the study hypotheses, we reviewed empirical studies on the impact of each of the selected dimensions (personalization and recommendation system) on customer satisfaction.

2.7.1 AI Personalization and Customer Satisfaction

Study by Canhoto et al. (2023):

Canhoto et al. (2023) investigated how customers exposed to AI-enabled, personalized offers, perceive and respond to it, using a qualitative, exploratory case study methodology. The unit of analysis for the study was shoppers' interactions with an AI-enabled smartphone application, in the context of fashion retail shops in the UK. In-depth, semi-structured interviews were used to gather customer experiences and allow participants to articulate their actions and intentions toward the AI-EP. Data generated from the interview were analyzed using NVIVO. The study established that personalized offers may deliver content gratification in the form of relevance, plus time, and cost savings

Study by Anzén and Ekberg (2020):

Anzén and Ekberg (2020) investigated how automatized personalization with AI can drive value in b2b marketing, using a case study of a Swedish industrial equipment manufacturer. A qualitative and exploratory case study was carried out in collaboration with the global B2B company Atlas Copco, a manufacturer of industrial equipment. Data were generated via semi-structured interviews. The study found that AI will enable more advanced personalization and value creation strongly revolve around the value types: 'excellence', 'efficiency', and 'privacy'.

Study by Tong et al. (2012):

Tong et al. (2012) investigate the interrelationship between the variables of service personalization and customer satisfaction in the Internet banking segment in Hong Kong. The study adopted a quantitative research method while utilizing an online questionnaire and multiple linear regressions for analysis. The findings of the study showed a significant positive effect of service personalization on customer satisfaction and e-loyalty.

Study by Liang et al. (2009):

Liang et al. (2009) investigated the effect of personalization on the perceived usefulness of online customer services. The study adopted an empirical research design method, utilizing a survey and ANOVA for statistical analysis. The findings showed the effect of personalized services is due to both economic and emotional factors, (called dual-core), and that e-tailers may use personalized customer services strategically to increase customer care.

Table 2.2: Summary of the Empirical Literature Reviewed on AI Personalization and Customer Satisfaction.

S/ N	Author (s)	Title of Work & Location	Methodology	Findings
1.	Canhoto et al. (2023)	Snakes and ladders: Unpacking the personalization-privacy paradox in the context of AI-enabled personalization in the physical retail Environment.	The study adopted qualitative, exploratory case study methodology and NVIVO for analysis.	The study established that personalized offers may deliver content gratification in the form of relevance, plus time, and cost savings
2.	Anzén and Ekberg (2020)	Understanding how automatized personalization with AI can drive value in b2b marketing: A case study of a Swedish industrial equipment manufacturer.	A qualitative and exploratory case study, semi structured interviews.	The study found that AI will enable more advanced personalization and value creation strongly revolves around the value types: ‘excellence’, ‘efficiency’ and ‘privacy’.
3.	Tong et al. (2012)	The influences of service personalization, customer satisfaction, and switching costs on e-loyalty.	The study adopted a quantitative research method, and multiple linear regressions.	The findings of the study showed a significant positive effect of service personalization on customer satisfaction and e-loyalty.
4.	Liang et al. (2009)	Effect of personalization on the perceived usefulness of online customer services: A dual-core theory.	Empirical research design method, utilizing survey and ANOVA for statistical analysis.	The findings showed the effect of personalized services is due to both economic and emotional factors, (called dual-core), and that e-tailers may use personalized customer services strategically to increase customer care.

Source: Literature Review (2023).

Based on the above findings, we formulated our first set of hypotheses:

H₀₁: There is no significant relationship between AI personalization and repeat purchase.

H₀₂: There is no significant relationship between AI personalization and customer referral.

2.7.2 Recommendation System and Customer Satisfaction

Also, several studies have been conducted to investigate the effect of AI recommendation systems on customer satisfaction.

The study by Kim et al. (2021):

Kim et al. (2021) evaluated the impact of a recommendation system on customer satisfaction using the expectancy disconfirmation theory approach, which is widely used in online e-commerce to identify customer satisfaction. The study generated a dataset from GroupLens and Amazon, including Item ID, User ID, and Rating. Using regression models the study shows that accuracy and diversity positively affect customer satisfaction when applying a deep learning-based recommender system.

The study by Cho et al. (2020):

Cho et al. (2020) empirically evaluated the effect of a product recommendation system on customer satisfaction using a survey research design. The database for the study was limited to adult male and female consumers in their 20s or older who have used Internet shopping malls for the last three months. Using a convenient sampling technique, a total sample of 300 individuals was surveyed through online questionnaires for about 17 days. Using multiple regressions to test the study hypotheses, the study found that the product recommendation system has a positive effect on customer satisfaction.

The study by Li et al. (2020):

The purpose of the study by Li et al. (2020) is to identify the elements that influence customer satisfaction when utilizing a personalized recommendation system. For this purpose, the study created a recommendation system using Deep Neural Networks (DNN) and assessed the accuracy of the recommendations, the diversity of recommended items, and customer satisfaction with the recommendation service. Using multiple regression analysis, the findings of the study's experiment indicated that higher accuracy and diversity in the recommendation system positively impact customer satisfaction.

The study by Yin et al. (2017):

The objective of the study by Yin et al. (2017) is to enhance customer satisfaction through the implementation of an online personalized recommendation system. Utilizing a novel associative classification approach, the paper predicts customer delight during the online recommendation process. The findings from the experimental study demonstrate that the online personalized recommendation system significantly increases customer satisfaction during the online experience.

The study by Fleder et al. (2011):

Fleder et al. (2011) studied recommender systems and their effects on consumers in the music industry using a quantitative research design. The researcher studied the fragmentation question using data from an online music service. Using permutation tests, the study found out that consumers simply purchase more after recommendations, increasing the chance of having more purchases in common.

Table 2.3: Summary of the Empirical Literature Reviewed on Recommendation Systems and Customer Satisfaction.

S/N	Author (s)	Title of Work & Location	Methodology	Findings
1.	Kim et al. (2021)	Customer satisfaction of recommender system: Examining accuracy and diversity in several types of recommendation approaches.	Expectancy disconfirmation theory approach and regression models.	The study shows that accuracy and diversity positively affect customer satisfaction when applying a deep learning-based recommender system.
2.	Cho et al. (2020)	A Study on the effect of product recommendation system on customer satisfaction: focused on the online shopping mall.	Survey research design and multiple regressions.	The study hypothesizes, the study found that product recommendation system has a positive effect on customer satisfaction.
3.	Li et al. (2020)	Evaluation of recommendation system for sustainable e-commerce: Accuracy, diversity, and customer satisfaction.	Quantitative research design, Deep Neural Networks (DNN), and multiple regression analysis.	The findings of the study's experiment indicated that higher accuracy and diversity in the recommendation system positively impact customer satisfaction.
4.	Yin et al. (2017)	A new recommendation system on the basis of consumer initiative decisions based on an associative classification approach.	Utilized a novel associative classification approach.	The findings from the experimental study demonstrate that the online personalized recommendation system significantly increases customer satisfaction during the online experience.
5.	Fleder et al. (2011)	Recommender systems and their effects on consumers: The fragmentation debate.	Quantitative research design, and permutation tests.	The study found that consumers simply purchase more after recommendations, increasing the chance of having more purchases in common.

Source: Literature Review (2023).

Based on the above findings, we formulated our second set of hypotheses:

Ho3: There is no significant relationship between the recommendation system and repeat purchases.

Ho4: There is no significant relationship between the recommendation system and customer referral.

3.1 Research Design

The research design adopted in this study is the quantitative research design method which utilized a cross-sectional survey method to generate data from the respondents of the study.

3.2 Research Population

The population for our study consisted of the customers of telecommunication firms in Port Harcourt, Rivers State. According to the Nigerian Communications Commission (NCC), the following are the telecommunication firms operating in Port Harcourt: Airtel Nigeria, MTN Nigeria, Globacom Nigeria, and 9mobile (formerly Etisalat Nigeria). This population is an infinite

population and the customers considered in the study as our infinite population was the customers of these four telecommunication firms listed above in Port Harcourt.

3.3 Sample Size and Sampling Techniques

Since the study population was noted to be an infinite population, we deployed the Godden (2004) sample size formula, to determine the appropriate sample size for the study.

Formula

SS =

Where:

SS = Sample Size for infinite population

Z = Z - value (e.g., 1.96 for a 95 percent confidence level)

P = Population proportion, expressed as decimal (assumed to be 0.5 (50%) since this would provide the maximum sample size)

C = Confidence interval, expressed as decimal (e.g., 5% expressed as = 0.05)

Hence:

Z = 1.96

P = 0.5

C = 0.05

Therefore, SS =

SS =

SS = = 384.16 Approx. = **384** as the sample size

Therefore, our sample size from the infinite population using Godden's (2004) method is three hundred and eighty-four (384).

3.4 Method of Data Analysis

This study involves three levels of analyses: primary, secondary, and tertiary analyses. The primary analysis involved descriptive statistics used to better understand the capacity of each of the respondents and the output was in the form of tables, charts, and graphs showing measures of central tendency and variability. While the secondary analysis employed the use of the Pearson Moment Correlation Coefficient to test the earlier stated hypotheses from the table analysis. And these were transferred to the SPSS spreadsheet for easy, clear, and timely computation.

3.5 Validity and Reliability of the Research Instrument

The questionnaire for this study was validated through expert checking (experienced researchers and experts in the field) for face and content validity. While the reliability of the used questionnaire was assessed through Cronbach's alpha coefficient in other to measure the internal consistency of the structured questionnaire scale.

Table 3.1 Reliability Statistics

S/N	Construct	No of items	Cronbach's Alpha
1.	AI Personalization	3	0.803
2.	Recommendation System	3	0.812
3.	Repeat Purchase	3	0.873
4.	Referral	3	0.811

Source: SPSS Result

Table 3.1 proves that Cronbach’s Alpha coefficient levels of all the constructs used in the study exceeded the popular benchmark of 7.0 given by Nunnally (1978). Hence, we claimed they are indeed reliable.

4.1 Analyses of Data Results

The study distributed 384 copies of the questionnaire among purposefully selected customers of the four identified telecommunication firms in Port Harcourt. Due to mistakes and incomplete responses, 22 copies were dropped, while 7 copies were lost in transit. Hence, the total response rate that formed the basis of our analysis was 355 representing 92%. Pearson's moment correlation coefficient was adopted through SPSS version 25 to analyze the relationships between the study variables.

4.1.1 Demographic Analysis

Demographic variables allow researchers to describe and understand the demographic composition of the sample population. It helps to determine whether the sample is representative of the target population or if any potential biases in the sample may affect the validity and reliability of the research findings.

Table 4.1: Frequencies on Gender of Respondents

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	201	56.6	56.6	56.6
	Male	154	43.4	43.4	100.0
	Total	355	100.0	100.0	

Source: Field Survey, 2023

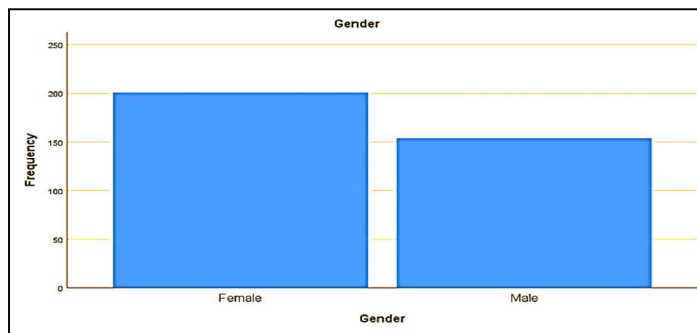


Figure 4.1 – Bar Chart showing frequencies for Gender

From the analysis in table 4.1 above, we can see that 154 (or 43.4%) of the respondents are male while 201 (or 56.6%) of them are female.

Table 4.2: Frequencies on Age Bracket of Respondents

		Age Bracket			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	15 - 20 years	92	25.9	25.9	25.9
	21 - 25 years	189	53.2	53.2	79.2
	26 & Above	74	20.8	20.8	100.0
	Total	355	100.0	100.0	

Source: Field Survey, 2023.

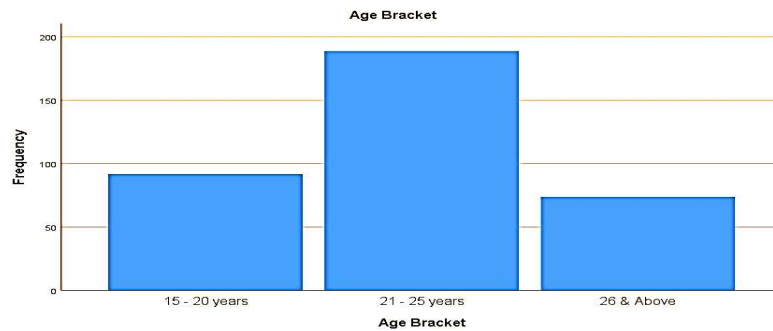


Figure 4.2 – Bar Chart showing frequencies for Age Bracket

Reports from table 4.2 on the analysis of age bracket of the respondents reveals that 92 (or 25.9%) are within the range of 15-20 years, 189 (or 53.2%) are within the age range of 21-25 years; 74 (or 20.8%) are within 26 & above.

Table 4.3: Frequencies on Respondents’ Level of Education

		Level of Education			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	High School	78	22.0	22.0	22.0
	Under Graduate	180	50.7	50.7	72.7
	Graduate	97	27.3	27.3	100.0
	Total	355	100.0	100.0	

Source: Field Survey, 2023.

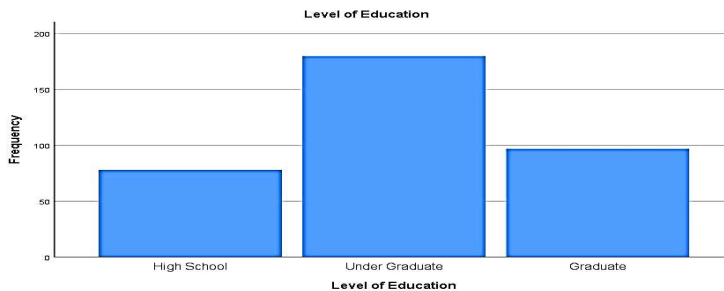


Figure 4.3 – Bar Chart showing frequencies for Level of Education

From Table 4.3, it shows that 78 (or 22.0%) of the respondents are high school graduates; 180 (or 50.7%) of the respondents are undergraduates; 97 (or 27.3%) are graduates.

Table 4.4: Frequencies on Respondents’ Length of Patronage

		Length of Patronage			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	1 - 2 years	72	20.3	20.3	20.3
	3 - 4 year	200	56.3	56.3	76.6
	5 years & Above	83	23.4	23.4	100.0
	Total	355	100.0	100.0	

Source: Field Survey, 2023

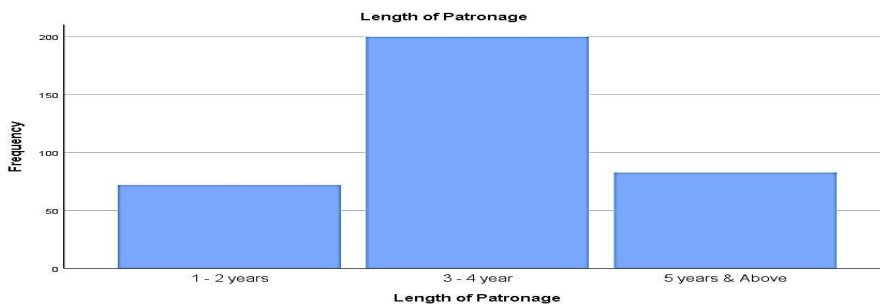


Figure 4.4 – Bar Chart showing frequencies for Length of Patronage

The analysis in Table 4.4 above reveals how long each respondent has been using their network provider. 72 (or 20.3%) of the respondents have used their mobile line for 1 - 2 years, 200 (or 56.3%) of them have used theirs for 3 - 4 years, while 83 (or 23.4%) have used theirs for 5 years and above.

4.1.2 Analysis Hypotheses

Tables 4.5 - 4.8 below explain the tests of the hypotheses. The Decision Rule for the test states that the null hypothesis (H0) should be rejected while the alternative (Ha) accepted if the p-value < 0.05 for 2 – the tailed test and conclude that a significant relationship exists.

Test of Hypothesis 1

Ho1: There is no significant relationship between AI personalization and repeat purchase.

Ha1: There is a significant relationship between AI personalization and repeat purchase.

Table 4.5: Correlations Analysis of AI Personalization and Repeat Purchase

		Correlations	
		AI Personalization	Repeat Purchase
AI Personalization	Pearson Correlation	1	.867**
	Sig. (2-tailed)		.000
	N	355	355
Repeat Purchase	Pearson Correlation	.867**	1
	Sig. (2-tailed)	.000	
	N	355	355

** . Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS Output 2023

Table 4.5 above shows the outcome of the correlation analysis using the SPSS version 25.0. The Pearson correlation coefficient is estimated as 0.867**. This suggests that a significant positive relationship exists between AI personalization and customer repeat purchase. Since the p-value (0.000) < 0.05, we reject the null hypothesis and conclude that a significant relationship exists between the two variables.

Test of Hypothesis 2

Ho₂: There is no significant relationship between AI personalization and customer referral.

Ha₂: There is a significant relationship between AI personalization and customer referral.

Table 4.6: Correlations Analysis of AI Personalization and Referral.

		Correlations	
		AI Personalization	Referral
AI Personalization	Pearson Correlation	1	.869**
	Sig. (2-tailed)		.000
	N	355	355
Referral	Pearson Correlation	.869**	1
	Sig. (2-tailed)	.000	
	N	355	355

** . Correlation is significant at the 0.05 level (2-tailed).
 Source: SPSS Output 2023

Table 4.6 above indicates that the correlation coefficient (*r*) is 0.869. This implies that a very strong relationship exists between AI personalization and referral. Also, the sign of (*r*) value is positive, indicating a direct link between the variables. Since the probability value (p-value) = 0.000 < 0.05, we conclude that a significant positive relationship exists between AI personalization and customer referral.

Test of Hypothesis 3

Ho₃: There is no significant relationship between the recommendation system and repeat purchases.

Ha₃: There is a significant relationship between the recommendation system and repeat purchases.

Table 4.7: Correlations Analysis of Recommendation System and Repeat Purchase.

		Correlations	
		Recommendation System	Repeat Purchase
AI Personalization	Pearson Correlation	1	.823**
	Sig. (2-tailed)		.000
	N	355	355
Recommendation System	Pearson Correlation	.823**	1
	Sig. (2-tailed)	.000	
	N	355	355

** . Correlation is significant at the 0.05 level (2-tailed).
 Source: SPSS Output 2023

The correlation analysis above was conducted to examine whether the recommendation system is associated with repeat purchases. The results revealed a significant and positive association ($r = 0.823$, $N = 355$, $p\text{-value} = 0.00$). Therefore, the null hypothesis is rejected while its alternative was accepted. The correlation was very strong in strength. Higher levels of AI recommendation system were associated with higher levels of customer repeat purchases.

Test of Hypothesis 4

Ho₄: There is no significant relationship between the recommendation system and customer referral.

Ha₄: There is a significant relationship between the recommendation system and customer referral.

Table 4.8: Correlations Analysis of Recommendation System and Referral

		Correlations	
		Recommendation System	Referral
Recommendation System	Pearson Correlation	1	.843**
	Sig. (2-tailed)		.000
	N	355	355
Referral	Pearson Correlation	.843**	1
	Sig. (2-tailed)	.000	
	N	355	355

** Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS Output 2023

Table 4.8 above reports the correlation between the recommendation systems and customer referral. It indicates that the correlation coefficient (r) is 0.843. This suggests that there is a very strong relationship between the recommendation systems and customer referral. The sign of the estimated value of (r) is positive while the $p\text{-value}$ is $0.000 < 0.05$. Hence, we reject the null hypothesis and conclude that there is a significant positive relationship between recommendation system and customer referral.

Table 4.9 Summary of Test Hypotheses

S/N	HYPOTHESES	(r)	P-VALUE	DIRECTIO N	Magnitude	DECISION	CONCLUSION
H ₀₁ :	There is no significant relationship between visual marketing strategy and customer patronage	0.867**	0.00	+VE	Very high	Reject	Significant
H ₀₂ :	There is no significant relationship between visual marketing strategy and repeat purchase	0.869**	0.00	+VE	Very high	Reject	Significant
H ₀₃ :	There is no significant relationship between visual marketing strategy and customers' referral	0.823**	0.00	+VE	Very high	Reject	Significant
H ₀₄ :	There is no significant relationship between auditory marketing strategy and customer patronage	0.843**	0.00	+VE	Very high	Reject	Significant

Source: Research Findings Based on SPSS Output

4.2 Discussion of Findings

The objective of this study was to ascertain the extent to which AI marketing relates to customers' Satisfaction. One of the dimensions of AI marketing which is AI personalization was discovered to have a significant positive relationship with the measures of customers' satisfaction (repeat purchase and referral). This finding was generated from the outcome of the statistical test of hypotheses Ho₁ and Ho₂ respectively. The test of Ho₁ shows that AI personalization attracts a significant positive correlation coefficient with repeat purchases ($r = 0.867$, $p\text{-value} < 0.05$). That is, the more telecommunication companies in Port Harcourt utilize AI to offer customers personalized services such as personalized data plans, personalized offers and promotions, AI-powered network optimization, personalized roaming plans, personalized billing and payment etcetera, the more they will achieve increased customer repeat patronage.

Test of Ho₂ reveals that AI personalization results in a significant positive correlation coefficient ($r = 0.869$, $p\text{-value} < 0.05$). Thus, increase in AI personalization will bring about an increase in customers' referral.

The foregoing findings as seen from the results of hypotheses 1 and 2 are believed to be premised on the fact that AI personalization services such as personalized data plans, personalized offers and promotions, AI-powered network optimization, personalized roaming plans, personalized billing and payment influences customers' value in terms of satisfaction behaviors. This is in line with the submissions of Anzén and Ekberg (2020) whose study found advanced AI personalization influences customer value creation which depends on the type of value ('excellence', 'efficiency' and 'privacy'). Also, the study by Tong et al. (2012) found out that service personalization has a significant positive effect on customer satisfaction and e-loyalty.

The second dimension of our predictor variable is recommendation system, and it was discovered to have a significant positive relationship with the measures of customers' satisfaction (repeat purchase and referral). The finding was generated from the outcome of the statistical test of hypotheses Ho₃ and Ho₄ respectively. The test of Ho₃ shows that recommendation system attracts a significant positive correlation coefficient with repeat purchase ($r = 0.823$, $p\text{-value} < 0.05$). Which proves that, the more telecommunication companies in Port Harcourt offers their customers good recommendation system such as data plan recommendation, voice and text bundles recommendation, value-added services (VAS) recommendation, device and upgrade recommendations, promotions and discounts recommendation, and network quality improvement recommendations, the more they will achieve increased customer repeat patronage.

Test of Ho₄ reveals that recommendation system results in a significant positive correlation coefficient ($r = 0.843$, $p\text{-value} < 0.05$). Hence, an increase in good recommendation system will generate an increase in customers' referral.

This finding is in tandem with the findings of Kim et al. (2021) in their study on customer satisfaction of recommender system, which showed that accuracy and diversity positively affect customer satisfaction when applying a deep learning-based recommender system. The study by Cho et al. (2020) corroborates this result with its findings that product recommendation system

has a positive effect on customer satisfaction. Also, the findings of the study's experiment by Li et al. (2020) indicated that higher accuracy and diversity in the recommendation system positively impact customer satisfaction.

5.1 Conclusion and Recommendations

Based on the data analysis results and findings, the study concludes that AI marketing has a significant positive impact on customers' satisfaction with the products and services of telecommunication companies in Port Harcourt, Rivers State, Nigeria. The findings as seen from the results of the hypotheses are premised on the fact that AI personalization, including personalized data plans, AI-powered chatbots, and personalized offers, coupled with AI recommendation systems, such as data plan recommendations, voice and text bundles recommendations, and roaming plan recommendations, help create feelings of customers achieving what they personally want.

Based on the conclusion, this study recommends the following:

1. **Invest in AI Marketing:** Based on the findings that AI marketing has a positive significant impact on customer satisfaction, consider investing in AI marketing initiatives, including AI personalization and recommendation systems, to enhance the customer experience. This could involve leveraging technologies such as personalized data plans, AI-powered chatbots, and personalized offers, along with data plan recommendations, voice and text bundle recommendations, and roaming plan recommendations, to create a personalized and relevant experience for customers.
1. **Prioritize Customer Personalization:** Recognize the importance of customer personalization in the telecommunications industry and prioritize it as part of the overall marketing strategy. Invest in technologies that enable personalized data plans, offers, and recommendations based on customer preferences, needs, and behaviors. This could include leveraging data analytics and machine learning algorithms to analyze customer data and provide relevant and customized offerings.
1. **Enhance Customer Engagement:** Utilize AI-powered chatbots and other customer engagement tools to improve customer interactions and provide timely and relevant support. Chatbots can help automate routine customer inquiries, provide personalized assistance, and enhance the overall customer experience. Consider integrating chatbots across various customer touchpoints, such as websites, mobile apps, and social media platforms, to provide seamless and consistent support.
1. **Leverage AI Recommendation Systems:** Implement AI recommendation systems, such as data plan recommendations, voice and text bundles recommendations, and roaming plan recommendations, to help customers discover relevant offerings and make informed choices. These recommendation systems can analyze customer data, usage patterns, and preferences to provide personalized and targeted recommendations, leading to increased customer satisfaction and loyalty.

1. **Train and Educate Staff:** Provide adequate training and education to staff on the use and benefits of AI marketing initiatives. Equip them with the necessary skills and knowledge to effectively leverage AI technologies in their interactions with customers. This can help ensure that AI marketing initiatives are utilized optimally and result in enhanced customer satisfaction.
2. **Continuously Monitor and Optimize:** Continuously monitor the performance of AI marketing initiatives, including personalization and recommendation systems, and optimize them based on data-driven insights. Regularly review and update the AI algorithms, customer segmentation, and recommendations to keep up with changing customer preferences and market dynamics, and to continuously improve the customer experience.

5.2 Recommendation for Further Study

Based on the findings of this study, several areas could be explored in future research to further advance our understanding of the impact of AI marketing on customer satisfaction with products and services of telecommunication companies in Port Harcourt, Rivers State, Nigeria. Some recommendations for further study are as follows:

1. **Investigation of Other Dimensions of AI Marketing:** This study focused on two dimensions of AI marketing, namely AI personalization and recommendation system. Future research could explore other dimensions of AI marketing, such as AI-powered chatbots, virtual assistants, and customer segmentation algorithms, to determine their influence on customer satisfaction.
2. **Comparative Study across Telecommunication Companies:** This study examined the influence of AI marketing on customer satisfaction across telecommunication companies in Port Harcourt. Future research could conduct a comparative study across different regions in Nigeria or even across different countries to explore potential differences in customer satisfaction with AI marketing in telecommunication companies.
3. **Impact of Ethical Considerations:** This study focused on the positive impact of AI marketing on customer satisfaction. Future research could investigate the ethical considerations associated with AI marketing, such as data privacy, security, and customer trust, to provide a more comprehensive understanding of the potential drawbacks and challenges of implementing AI marketing strategies.

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