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The Role of Artificial Intelligence in Personalizing Customer Experience in Nigeria's Online Grocery Retail Market

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ABSTRACT

The growing demand for seamless and tailored online shopping experiences has led to the integration of Artificial Intelligence (AI) technologies in retail, particularly in emerging markets like Nigeria. This study investigated the role of AI-driven personalization, specifically product recommendations, chatbots, and dynamic pricing, in enhancing customer satisfaction, trust, and loyalty in Nigeria's online grocery retail sector. A quantitative cross-sectional survey was conducted with 400 online grocery shoppers across Lagos, Abuja, and Port Harcourt. Data were collected using a structured questionnaire and analysed using descriptive statistics, confirmatory factor analysis, and structural equation modelling. The results indicated that AI personalization significantly improves customer satisfaction ($\beta = 0.54$, $p < 0.001$), which in turn enhances trust ($\beta = 0.41$, $p < 0.001$) and loyalty ($\beta = 0.48$, $p < 0.001$). Additionally, AI features independently influence trust and loyalty, underscoring their strategic importance in digital retail. These findings highlight that ethically implemented, context-aware AI systems can strengthen customer engagement, foster trust, and drive long-term loyalty. The study contributes to the growing body of knowledge on digital transformation in African markets and provides practical insights for online retailers seeking to enhance customer experience through AI personalization.

Keywords*: Artificial Intelligence, Personalization, Customer Satisfaction, Trust, Customer Loyalty, Online Grocery, E-commerce,*

INTRODUCTION

The rise of electron commerce (e-commerce) has dramatically transformed the retail landscape across the globe, creating new consumer behaviours, expectations, and competitive pressures. As consumers increasingly demand seamless, intuitive, and personalized shopping experiences, businesses are leveraging advanced technologies to meet these expectations. Among these technologies, Artificial Intelligence (AI) which is on the lips of most persons recently (Arachie, Dibua, Idigo, 2023). AI stands out as a powerful tool that enables retailers to automate, customize, and optimize every stage of the customer journey. From product recommendations and dynamic pricing to intelligent chatbots and supply chain management, AI is reshaping the digital commerce ecosystem globally (Jayakumar et al., 2024; Gambhir et al., 2024). While this transformation is well documented in developed economies, there is growing interest in understanding how AI is influencing retail behaviour in emerging markets such as Nigeria, particularly within the online grocery segment (Patel et al., 2023).

Online grocery retailing is gaining significant momentum in Nigeria, driven by urbanization, smartphone penetration, changing lifestyles, and the expansion of digital payment systems (Odeh, 2024). Lagos, Abuja, and Port Harcourt have witnessed a surge in demand for digital grocery platforms due to increasing time constraints, traffic congestion, and the convenience offered by home delivery services. However, unlike in mature markets where online retail infrastructures are more developed, Nigerian online grocery retailers face the dual challenge of meeting logistical demands while delivering personalized and satisfying customer experiences (Adaobi et al., 2024). In this

context, AI technologies offer a promising solution for retailers seeking to differentiate themselves through enhanced customer engagement, trust-building, and loyalty (Oke et al., 2024).

AI applications in retail operate primarily through machine learning algorithms, natural language processing, and real-time analytics, which collectively help retailers understand, anticipate, and respond to individual customer preferences. One of the most prevalent use cases is AI-powered recommendation engines that analyse historical purchasing behaviour and browsing patterns to suggest relevant products. This has been shown to increase sales and user satisfaction by reducing decision fatigue and enhancing perceived value (Jayakumar et al., 2024). In Nigeria, Odeh (2024) found that personalized product suggestions improved customer nutritional awareness and satisfaction in grocery shopping, indicating a strong link between AI-driven personalization and positive behavioural outcomes.

Another prominent AI tool in the retail space is the chatbotvirtual assistants capable of understanding and responding to customer queries using natural language. These systems reduce operational costs and response time, while offering customers 24/7 support. In Nigeria's broader service industry, AI chatbots have been recognized for improving efficiency, reducing error margins, and enhancing customer trust (Adaobi et al., 2024). Trust is an essential component of the customer experience, especially in e-commerce environments where face-to-face interactions are limited. By providing consistent, transparent, and helpful responses, AI chatbots contribute to building trust and credibility, which are key to fostering long-term customer relationships.

Dynamic pricing, another AI application enables online retailers to adjust prices in real time based on supply-demand dynamics, competitor prices, and customer segments. Globally, this strategy has been linked to increased profitability and perceived fairness when deployed transparently (Gambhir et al., 2024). In the Nigerian context, while dynamic pricing is still emerging, its potential to influence customer satisfaction and purchase decisions is significant, especially in price-sensitive segments.

The effectiveness of these AI tools ultimately reflects in three critical dimensions of customer experience: satisfaction, trust, and loyalty. Customer satisfaction is influenced by how well the shopping platform meets the user's expectations in terms of convenience, personalization, and service quality. Studies have shown that AI features such as product recommendations, responsive chatbots, and adaptive interfaces enhance customer satisfaction in e-retail settings (Bhatt & Singh, 2025). Satisfaction not only improves the likelihood of repeated purchases but also influences word-of-mouth marketing and customer advocacy.

Trust, on the other hand, refers to the consumer's belief that the retailer will deliver as promised, protect personal data, and act ethically. In Nigeria, where digital fraud and data privacy concerns remain prevalent, building trust through transparent AI interactions is a necessity. Oke et al. (2024) found that while many Nigerian consumers are aware of AI in retail, only a minority base their purchasing decisions on AI-generated suggestions, largely due to moderate trust in the technology. Hence, responsible AI deployment, emphasising explainability, fairness, and securityis crucial to gaining consumer confidence.

Loyalty, the long-term outcome of repeated positive experiences, is a primary goal of AI-driven personalization. When customers perceive a brand as reliable, responsive, and relevant to their needs, they are more likely to return and make future purchases. A comparative study between India and Nigeria confirmed that AI-enhanced customer engagement significantly improves customer loyalty, although the extent varies depending on socio-economic and regulatory contexts (Patel et al.,2023).

In Nigeria's competitive and growing online grocery market, fostering loyalty through consistent, personalized, and ethical AI practices can be a decisive advantage for retailers.

However, the adoption of AI in Nigerian retail is not without challenges. Infrastructure deficits, digital literacy gaps, and affordability issues can hinder the effective implementation of AI systems. Furthermore, concerns about data privacy, algorithmic bias, and customer manipulation must be addressed through strong governance frameworks and user education. Despite these challenges, the potential benefits of AI-driven personalization in improving customer experience, particularly in the online grocery sector, are substantial and largely untapped. This study, therefore, aims to explore the role of AI in enhancing customer satisfaction, building trust, and fostering loyalty in Nigeria's online grocery retail sector. Specifically, it investigates how AI features such as product recommendations, dynamic pricing, and chatbots influence customer perceptions and behaviours.

REVIEW OF RELATED LITERATURE

AI and Personalization in Retail

Artificial Intelligence (AI), broadly defined as the simulation of human intelligence by machines capable of learning, reasoning, and decision-making, has become a transformative force across industries, including retail. When machines, applications and software are deployed to make decisions and take actions like intelligent humans, then AI is said to be in action (Arachie, Nwosu, Ugwuanyi & Ibrahim, 2025). In the retail sector, AI is leveraged to analyze consumer data, automate interactions, and deliver personalized experiences in real time (Gambhir et al., 2024). The digital transformation of retail markets globally has been accelerated by the adoption of AI, especially in e-commerce. As customers increasingly demand tailored and seamless shopping experiences, personalization powered by AI has emerged as a critical strategy for online retailers. AI systems are now central to understanding consumer behaviour, predicting preferences, and delivering relevant interactions at scale. While much of the existing literature focuses on developed markets, there is a growing body of research exploring the impact of AI on personalization in emerging economies like Nigeria. In Nigeria's burgeoning online grocery sector, where urbanization, mobile connectivity, and changing lifestyles are fuelling e-commerce growth, the integration of AI technologies is becoming vital to sustaining customer engagement and loyalty (Odeh, 2024).

Product Recommendations

One of the most impactful AI tools in e-commerce is the recommendation engine. These systems utilize algorithms based on user behaviour, purchase history, and collaborative filtering to suggest relevant products to users. Personalized recommendations enhance customer convenience and satisfaction by reducing search time and increasing the likelihood of discovering desired products. Research shows that AI-based product recommendation systems significantly influence customer purchase decisions and loyalty, particularly in the grocery segment where frequent, repeated purchases are common (Srivastava et al., 2023).

In Nigeria, Odeh (2024) found that personalized nutrition and grocery suggestions helped customers make healthier choices while also increasing trust in online platforms. Olaghere et al. (2023) also noted that Nigerian grocery retailers are beginning to leverage digital personalization technologies such as AI-driven recommendation engines to improve service delivery and customer satisfaction. Their study revealed that these technologies are valued not only for enhancing the user experience but also for driving operational efficiency and business growth in competitive urban markets like Lagos and Abuja. As consumer expectations rise, such recommendation systems are becoming instrumental in helping retailers foster trust, relevance, and loyalty among their customer base.

AI Chatbots and Virtual Assistants

Chatbots, another key personalization tool, leverage natural language processing (NLP) to simulate human interaction and provide 24/7 support. These AI-driven tools are capable of handling customer inquiries, recommending products, and streamlining checkout processes, functions that significantly enhance the digital shopping experience. Nigerian service industries, including retail and banking have increasingly adopted chatbots to improve customer satisfaction, with evidence suggesting that responsive AI assistants enhance both perceived service quality and consumer trust (Adaobi et al., 2024). Globally, chatbots contribute positively to user engagement, reduce operational costs, and personalize the experience based on real-time customer data (Dai & Liu, 2024).

Recent research in Nigeria further underscores the growing influence of AI chatbots on consumer behaviour. A study by Oke et al. (2024) examining youth consumers in Southwest Nigeria found that AI chatbot usage significantly shaped purchasing decisions, particularly among digitally literate users. The study highlighted factors such as user interface design, online literacy, and data affordability as key determinants of chatbot adoption and effectiveness in e-commerce platforms. Additionally, Afolayan et al. (2024) found that socio-demographic factors like education level and perceived convenience play a critical role in influencing the intensity of AI chatbot usage for online purchases in Nigeria. These findings suggest that with improved access, education, and design, AI chatbots can further transform customer engagement in Nigeria's digital retail ecosystem.

Dynamic Pricing Systems

Artificial Intelligence (AI) has revolutionized pricing strategies in retail through the adoption of dynamic pricing systems, automated algorithms that adjust prices in real-time based on customer behaviour, demand patterns, competition, and inventory levels. Unlike traditional static pricing, dynamic pricing enables retailers to respond quickly to market fluctuations, optimize revenue, and offer tailored pricing that reflects individual customer profiles and shopping patterns. This pricing agility helps businesses remain competitive while enhancing consumers' perception of fairness and value (Gambhir et al., 2024). Globally, the effectiveness of dynamic pricing has been demonstrated in various sectors, particularly e-commerce, where real-time data from millions of transactions are leveraged to continuously refine price offerings. Gambhir et al. (2024) found that AI-powered pricing not only boosts sales but also contributes to customer satisfaction when pricing decisions are perceived as fair, responsive, and relevant to individual needs. Reinforcement learning models such as Q-learning are now used to train AI systems to adaptively update prices based on customer interactions and demand shifts, delivering better financial outcomes for retailers (Apte et al., 2024).

In Nigeria, the adoption of AI-based pricing tools is still emerging but holds significant potential, especially in the online grocery retail space. Recent studies show increasing interest among Nigerian retailers in using AI and data analytics to manage supply-demand imbalances and optimize pricing strategies (Odeh, 2024). For instance, Ogbonna et al. (2019) applied an artificial neural network (ANN) model to electricity pricing in Nigeria, demonstrating how AI could forecast and optimize prices in real time, improving both provider cost recovery and consumer satisfaction. While this study was conducted in the energy sector, the methodology and outcomes are highly relevant to retail pricing strategies.

Similarly, Igbinosa (2011) utilized AI techniques to assess price fairness in Nigeria's residential real estate markets and found that ANN models could predict fair market values with high accuracy, suggesting the broader applicability of AI to dynamic pricing scenarios in Nigerian commerce. These examples underscore the potential of AI-driven pricing systems to enhance pricing efficiency and

fairness in Nigerian markets. Despite the benefits, challenges persist in Nigeria. Limited infrastructure, digital literacy gaps, and consumer distrust in automated systems can hinder the adoption of dynamic pricing. However, as more Nigerian consumers become digitally active and as local retailers invest in digital transformation, the use of AI-powered pricing tools is expected to increase, especially in price-sensitive sectors like online groceries.

Customer Satisfaction

Customer satisfaction is a fundamental outcome of successful AI personalization. By delivering relevant, timely, and engaging experiences, AI can significantly enhance how customers perceive a brand. In Nigeria's service industry, AI applications have been found to increase satisfaction through automation, predictive analytics, and tailored communications (Adaobi et al., 2024). Internationally, personalized product recommendations, chat support, and smooth digital interfaces are closely tied to improved satisfaction levels (Jayakumar et al., 2024). Studies confirm that satisfied customers are more likely to engage in repeat transactions, recommend the platform to others, and form stronger emotional bonds with the brand. In particular, real-time AI responses during peak demand (e.g., festive seasons or emergencies) reinforce trust and demonstrate service reliability (Dai & Liu, 2024).

In Nigeria, Odeh (2024) found that AI-driven personalization features such as nutrition-based product suggestions and automated feedback significantly contributed to customer satisfaction in online grocery shopping, especially when aligned with health and lifestyle goals. Furthermore, Mashi et al. (2024) demonstrated that the strategic use of AI among Nigerian manufacturing and retail firms, particularly in customer-facing roles has a direct, positive impact on satisfaction levels, competitive advantage, and operational efficiency. Their findings reinforce the argument that beyond automation, the relevance and quality of AI applications are what truly drive customer satisfaction in Nigeria's business environment.

Customer Trust

Trust is a critical variable influencing the effectiveness of AI personalization. While AI can enhance trust by delivering consistent and accurate services, it can also raise concerns about data privacy, surveillance, and transparency. In Nigeria, customers are becoming increasingly aware of AI's presence in online platforms, but many express reservations about how their data is collected, stored, and used (Oke et al., 2024). Therefore, the ethical deployment of AI, including secure data handling, explainable algorithms, and clear opt-in policies is essential to building trust in digital retail. Canhoto et al. (2023) describe this tension as the "personalization-privacy paradox," where users appreciate customized services but simultaneously fear exploitation or misuse of their personal information. Ensuring transparency in AI decision-making and granting users greater control over their data can mitigate these concerns and strengthen long-term consumer trust.

Recent Nigerian studies further emphasize that trust is not just a technical outcome but also a relational and emotional factor in consumer decision-making. Durugbo (2022), in a study of online retail stores in Lagos, found that customer trust significantly moderated the relationship between strategic innovation and business outcomes, suggesting that even well-designed AI tools lose effectiveness without customer trust. Similarly, Eshiett (2021) highlighted that trust in service providers, particularly regarding data security and responsiveness, is essential for Nigerian consumers to fully embrace online shopping platforms. These findings underscore the importance of trust-building strategies beyond just AI efficiency, in fostering sustainable consumer relationships in Nigeria's digital retail landscape.

Customer Loyalty

Loyal customers are those who not only repeatedly purchase from a platform but also advocate for it within their networks. AI drives loyalty by offering seamless, consistent, and memorable experiences across touchpoints. Bhatt &Singh (2025) found that in the online grocery sector, customers who interacted with AI systems, such as voice assistants and intelligent product suggestions, reported a stronger intention to repurchase and recommend the brand to others. These systems create a sense of relevance and recognition that fosters emotional bonds and long-term engagement with a platform.

In the Nigerian retail ecosystem, early adopters of AI technologies have reported notable improvements in customer retention and brand differentiation. Particularly in urban centres like Lagos and Abuja, the precision and speed of AI-powered platforms have influenced consumers' repeat purchase behaviour (Odeh, 2024). Patel et al. (2023) found that AI-driven personalized marketing strategies significantly enhance customer satisfaction and loyalty in both India and Nigeria, with Nigerian consumers responding positively to AI features that respect privacy and deliver culturally relevant recommendations. Furthermore, Chiyem et al. (2024) highlighted that the use of omni-channel strategies, including AI-powered mobile apps and real-time personalization has contributed to increased loyalty among users of major Nigerian e-commerce platforms like Jumia and Konga, especially when supported by localized service experiences. These findings confirm that AI personalization not only enhances transactional value but also strengthens long-term consumer relationships in Nigeria's digital economy.

Theoretical Review

The rapid adoption of Artificial Intelligence (AI) in online retail platforms has driven the need for robust theoretical models to explain how users interact with and accept such technologies. Two of the most relevant and widely applied frameworks in this context are the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). Both offer critical insights into user behaviour, system usability, and the socio-cultural determinants of technology acceptance, particularly in Nigeria's growing e-commerce landscape.

Technology Acceptance Model (TAM)

Proposed by Davis (1989), TAM posits that user acceptance of a technology is primarily determined by two perceptions: perceived usefulness (PU) and perceived ease of use (PEOU). PU refers to the degree to which a person believes that using a system will enhance their performance, while PEOU refers to the effort expected in using the technology. These beliefs influence users' attitudes, which in turn shape their behavioural intention and eventual usage.

TAM is particularly relevant to AI personalization in retail, where user interaction with tools such as recommendation engines and chatbots must be both effective and seamless. In Nigeria, researchers such as Ezennia & Marimuthu (2020) adapted TAM to study e-commerce adoption and found that trust, enjoyment, and perceived price value were critical extensions needed to reflect the expectations of Nigerian consumers. Their modified TAM model captured the influence of economic conditions and trust in digital systems, both of which are highly relevant in emerging markets like Nigeria. Furthermore, Yakubu & Dasuki (2019) demonstrated the model's relevance in education technology adoption in Nigeria, emphasizing that even among digitally literate populations, the ease of use and social influence were vital in shaping usage behaviour. Their findings underscore TAM's versatility in explaining technology use beyond its original workplace setting and justify its applicability to consumer-facing AI technologies in Nigeria's online retail.

Unified Theory of Acceptance and Use of Technology (UTAUT)

Developed by Venkatesh et al. (2003), UTAUT synthesizes elements from eight different models, including TAM and DOI, into a unified framework. It introduces four core constructs that influence technology acceptance: performance expectancy, effort expectancy, social influence, and facilitating conditions. These constructs are moderated by variables like age, gender, experience, and voluntariness of use. UTAUT is especially useful for understanding AI adoption in complex, multi-user environments like Nigeria's online grocery sector. It captures not only individual user expectations but also the social and infrastructural factors influencing technology uptake. Chiemeke & Evwiekpaefe (2011) developed a modified UTAUT model tailored to Nigeria, integrating cultural and trust-based constructs. Their framework revealed that social norms and trust in payment systems significantly affect e-commerce adoption in the country.

Recent research by Umar (2020) applied UTAUT to online shopping behaviours in Kano, Nigeria. The study found that awareness of online services, mobile skilfulness, and performance expectancy were the most important predictors of consumer intention. These findings are particularly relevant for AI personalization, where trust, mobile accessibility, and system efficiency are central to user retention and loyalty. The robustness of UTAUT in AI and e-commerce contexts is also supported by Oye (2018), who found that performance and effort expectancy were highly significant in predicting the acceptance of ICT systems among Nigerian academics. The study highlighted that users' expectations of technology delivering real value and ease are universal, regardless of sector, and essential for sustained engagement.

Together, TAM and UTAUT provide a well-rounded theoretical foundation for studying the interaction between AI-driven personalization and customer experience in Nigeria's online grocery market. TAM explains the cognitive mechanisms influencing user attitudes, while UTAUT addresses the broader social and infrastructural context that shapes technology acceptance. These models are not static; they continue to evolve through empirical application, and their relevance in the Nigerian e-commerce space is consistently reaffirmed.

Empirical Review

The influence of artificial intelligence (AI) personalization on customer experience, satisfaction, trust, and loyalty in e-commerce has gained momentum as a focus of empirical research. Globally and locally, studies reveal that AI-enabled tools such as recommendation engines, chatbots, and predictive analytics significantly shape customer behaviour and perception, particularly in the online grocery segment.

First, a growing body of research demonstrates the impact of AI personalization on customer satisfaction. Chandrakumar (2024), in a mixed-methods case study of a global retailer, found that AI-driven personalization through tailored recommendations, smart search results, and predictive analytics led to a 22% increase in customer satisfaction scores, a 25% boost in conversion rates, and longer customer engagement. These outcomes affirm that personalized customer journeys result in improved customer sentiment and loyalty metrics. Complementing this, Dai & Liu (2024) used regression analysis in a large-sample study (n=760) to show that AI personalization ($\beta = 0.35$, $p < 0.001$) was the most influential predictor of consumer purchase intentions and satisfaction in online retail contexts.

In Nigeria, Odeh (2024) conducted a survey of 400 online grocery shoppers in Lagos, Abuja, and Port Harcourt and discovered a strong positive relationship between AI-enabled personalization (including nutrition-based recommendations) and consumer trust and satisfaction. The study

highlighted that consumer appreciated personalized digital grocery services that aligned with their health goals and daily routines. Similarly, Ojeanor & Funaya (2018) investigated personalization and privacy in online shopping among Nigerian retailers, concluding that personalization significantly enhances customer loyalty when paired with strong data privacy assurances.

Sharko & Sokolova (2025) a quantitative study on 384 e-grocery users and confirmed a positive correlation between personalization, satisfaction, and trust. They developed a triadic model (Satisfaction → Trust → Loyalty), emphasizing the mediating role of trust in loyalty formation. In Nigeria, this triadic effect is reflected in findings by Izogo et al. (2017), who analysed relationship quality (trust, satisfaction, commitment) among retail banking customers. Their structural equation model showed that trust and satisfaction directly influenced customer loyalty, a relationship translatable to e-commerce where AI systems handle sensitive customer data.

In Nigeria, Chiyem et al. (2024) empirically analysed omni-channel retail strategies across e-commerce platforms such as Jumia, Konga, and Jiji. Their findings showed that integrated mobile and in-store platforms, when optimized through AI, enhance customer loyalty by creating flexible, personalized, and consistent shopping journeys that meet the expectations of digitally savvy consumers. Additionally, Patel et al. (2023) conducted a comparative study on AI-driven personalized marketing between India and Nigeria, showing that Nigerian consumers increasingly value adaptive systems that align with their shopping habits, language, and cultural norms. The research found that personalization features based on AI not only improve client engagement but also reinforce long-term brand commitment.

Furthermore, segmentation research by Bauerova et al. (2023) identified five types of online grocery shoppers, such as “loyal traditionalists” and “satisfied conditional loyalists”, based on variables including satisfaction, personalization, and loyalty tendencies. These insights support the growing understanding that effective AI systems must cater to diverse consumer personas. Empirical studies also show that trust in AI is not only driven by system accuracy but also transparency and perceived control. Raji et al. (2021) documented through qualitative interviews that consumers appreciated being offered options aligned with their identity, values, and past behaviour, making AI personalization feel empowering rather than invasive.

Taken together, empirical research confirms that AI personalization tools play a pivotal role in improving satisfaction, building trust, and enhancing customer loyalty in online grocery retail, especially when tailored to local socio-cultural dynamics, as seen in recent Nigerian studies. This reinforces the strategic value of investing in ethical, user-centric AI systems to secure long-term consumer relationships in emerging markets.

Methodology

This study employed a quantitative, cross-sectional survey approach to investigate the influence of AI-powered personalization tools, such as product recommendations, chatbots, and dynamic pricingon customer satisfaction, trust, and loyalty in Nigeria’s online grocery retail sector. A survey research design was chosen due to its ability to systematically collect quantifiable data from a large population within a limited time frame, allowing for empirical testing of relationships between constructs (Saunders et al., 2019). The study focused on Nigerian adults aged 18 to 45 years who shop for groceries online, particularly in the major urban centres of Lagos, Abuja, and Port Harcourt. These cities were selected due to their high internet penetration, active digital marketplaces, and concentration of online grocery shoppers (Odeh, 2024). Using Cochran’s formula for sample size

calculation for an unknown population, the minimum sample size was determined to be 384, which was rounded up to 400 to increase representativeness and account for non-response.

A non-probability convenience sampling technique was employed to efficiently access respondents with prior experience using AI-powered grocery platforms such as Jumia, Konga, Supermart, and PricePadi. This approach is considered appropriate when targeting tech-savvy populations in digital commerce contexts (Etikan & Bala, 2019). Data were collected through a structured, self-administered online questionnaire disseminated via WhatsApp groups, Twitter links, and emails to active online shoppers, ensuring wider reach with minimal physical interaction (Wright, 2019). The questionnaire comprised three sections. The first section captured socio-demographic data, including age, gender, education level, income, and preferred online grocery platforms. The second section assessed key constructs of the study using validated measurement scales. Items measuring AI personalization features (e.g., chatbot responsiveness, product recommendations, dynamic pricing) were adapted from Dai and Liu (2024). Customer satisfaction was assessed using items from Srivastava et al. (2023), customer trust using measures adapted from Izogo et al. (2017), and customer loyalty using validated items from Ganapathy (2025). All items were measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

To ensure instrument validity, the draft questionnaire was reviewed by two marketing scholars and one AI practitioner for clarity, relevance, and contextual appropriateness. Their feedback led to minor refinements in item phrasing. Exploratory Factor Analysis (EFA) was conducted to confirm construct validity, ensuring that items loaded appropriately on their respective constructs (Hair et al., 2020). Reliability was tested using Cronbach's alpha, with all scales exceeding the recommended 0.70 threshold (Taber, 2019). Specifically, the AI personalization scale had an alpha of 0.88, customer satisfaction 0.86, customer trust 0.85, and customer loyalty 0.87, indicating strong internal consistency.

To address Common Method Variance (CMV), a potential concern in self-report surveys, both procedural and statistical controls were applied. Respondents were assured of anonymity and encouraged to provide honest responses without fear of judgment, reducing evaluation apprehension. Harman's single-factor test was conducted, and the results showed that no single factor accounted for more than 30% of the total variance, confirming that CMV was not a significant issue (Podsakoff et al., 2019). Data were analysed using SPSS version 25. Descriptive statistics were employed to profile the respondents, while inferential analyses, including multiple regression were used to test the study's hypotheses at a 5% significance level. The regression model helped evaluate the strength and direction of the relationships between AI personalization and customer satisfaction, trust, and loyalty.

The rigorous instrument design, careful sampling, and robust statistical procedures employed in this study contribute to the validity, reliability, and generalizability of findings across Nigeria's digital grocery ecosystem.

4. Data Analysis

Several sequential processes constituted the data analysis for this study, ensuring the validity, reliability, and appropriate interpretation of the findings on the influence of AI personalization on customer satisfaction, trust, and loyalty. Responses were collected over a six-week period via an online structured questionnaire administered through Google Forms and distributed across WhatsApp, Twitter, and targeted email lists focused on users of Nigeria's leading online grocery platforms (e.g., Jumia, Konga, Supermart and PricePadi). A preliminary screening was performed to

exclude incomplete or duplicate responses. Only fully completed surveys were retained, resulting in a final sample of 400 respondents. The cleaned dataset was exported to SPSS Version 25 and SmartPLS 4.0 for statistical analysis.

Descriptive Analysis

The first phase of data analysis involved the use of descriptive statistics to summarize respondents' demographic characteristics, including age, gender, education level, employment status, monthly income, and primary online grocery platform used. Frequencies, percentages, means, and standard deviations were calculated to provide an overview of the sample distribution. Additionally, descriptive statistics for key study constructs, such as, AI personalization features, customer satisfaction, trust, and loyaltywere computed to understand the general tendencies among online grocery consumers in Nigeria.

Common Method Variance (CMV) Assessment

Given that the data was collected through self-report at a single point in time, it was critical to assess for common method variance (CMV). Harman's Single Factor Test was employed for this purpose, where all questionnaire items were loaded into an exploratory factor analysis (EFA) with no rotation. According to Podsakoff et al. (2003), if a single factor does not account for more than 50% of the total variance, CMV is unlikely to be a significant issue. In this study, the first factor explained only 28.4% of the variance, indicating that CMV was not a serious concern.

Reliability and Validity Testing

Reliability was assessed using Cronbach's Alpha, with all constructs exceeding the 0.70 benchmark suggested by Nunnally & Bernstein (1994), confirming strong internal consistency. Specifically:

- AI Personalization: $\alpha = 0.88$
- Customer Satisfaction: $\alpha = 0.86$
- Customer Trust: $\alpha = 0.85$
- Customer Loyalty: $\alpha = 0.87$

Further validation was performed using Confirmatory Factor Analysis (CFA) via SmartPLS. Composite Reliability (CR) values for each construct exceeded the recommended 0.70 threshold, and Average Variance Extracted (AVE) values were all above 0.50, indicating adequate convergent validity (Hair et al., 2019). To test discriminant validity, the Fornell-Larcker criterion was applied. Each construct's AVE square root exceeded its correlation with other constructs, confirming discriminant validity (Fornell & Larcker, 1981). All factor loadings for individual items were above 0.50, meeting the standard for construct validity.

Hypotheses Testing

To test the research hypotheses, Structural Equation Modelling (SEM) using SmartPLS 4.0 was employed. SEM was chosen for its ability to evaluate complex relationships between latent constructs and account for measurement errors. The strength and significance of paths between constructs were evaluated using path coefficients (β), t-statistics, and p-values. A p-value < 0.05 was considered statistically significant.

Where SEM was unavailable, alternative multiple regression analyses were conducted using SPSS 25. These regressions tested the effect of independent variables such as AI personalization features (e.g., chatbots, recommendations, dynamic pricing) on dependent variables like customer satisfaction, trust, and loyalty.

All findings were reported through structured tables that included model fit indices, factor loadings, reliability coefficients, and hypothesis test outcomes. See appendix A. The combination of descriptive, exploratory, and inferential analyses ensured rigorous data interpretation, strengthening the credibility, validity, and generalizability of the study's results within the Nigerian online retail context.

4.1 Discussion of Findings

The results of this study offer substantial empirical support for the theoretical assumptions regarding the influence of AI-driven personalization tools on customer satisfaction, trust, and loyalty in Nigeria's online grocery retail sector. Across all tested hypotheses, the findings confirm that AI personalization features, including product recommendations, chatbots, and dynamic pricing, positively influence the quality of customer experience and foster long-term brand engagement.

First, the study revealed that AI personalization significantly predicts customer satisfaction ($\beta = 0.54$, $p < 0.001$). This finding aligns with the Technology Acceptance Model (Davis, 1989), which emphasizes that perceived usefulness and ease of use are major drivers of user satisfaction. When customers receive personalized recommendations or interact with efficient AI-powered chatbots, they are more likely to perceive the platform as helpful and enjoyable. This is consistent with the findings of Srivastava et al. (2023**)**, who demonstrated that AI-based recommendation systems improve satisfaction by reducing search time and providing relevant product suggestions. In Nigeria, Odeh (2024) found similar outcomes in the online grocery space, were personalized health and nutrition tips enhanced customer perception and convenience.

Second, the analysis confirmed that customer satisfaction strongly predicts customer trust ($\beta = 0.41$, $p < 0.001$). This supports prior studies that highlight satisfaction as a precursor to trust in service relationships (Izogo et al., 2017). In AI-enabled e-commerce, trust is built not only through system reliability but also through data transparency and ethical personalization. As noted by Raji et al. (2021), trust in AI tools is influenced by the accuracy and cultural appropriateness of recommendations. Customers in this study indicated higher trust levels when AI systems demonstrated understanding of local shopping habits, timely support, and value-driven offers. This is aligned with UTAUT's (Venkatesh et al., 2003) framework, which integrates effort expectancy and social influence as trust-enhancing mechanisms.

Thirdly, the results showed that customer trust significantly influences loyalty ($\beta = 0.48$, $p < 0.001$). This relationship reinforces the triadic link between satisfaction, trust, and loyalty, as previously evidenced in the service marketing literature (Izogo et al., 2017; Sharko & Ivanova, 2022). Customers who trust AI-enabled services are more likely to return for repeat purchases and advocate for the brand. This is particularly important in the Nigerian market, where digital literacy and infrastructural challenges can affect perceptions of online reliability. The findings also mirror those of Ganapathy (2025), who reported that AI-enhanced loyalty programs increase retention when users trust the fairness and relevance of reward systems.

Moreover, the data showed that AI personalization directly influences trust ($\beta = 0.39$, $p < 0.001$), independent of satisfaction. This implies that intelligent systems that anticipate consumer needs and offer real-time solutions can foster trust through perceived competence and attentiveness. The

implication is that responsive AI tools, especially during high-demand periods such as festive seasonscan reinforce platform credibility, as also noted by Dai & Liu (2024). In Nigeria, Chiyem et al. (2024) found that the integration of culturally relevant chatbot interfaces improved users' trust and loyalty, underscoring the importance of localized AI adaptation.

Lastly, the analysis revealed that customer satisfaction is a partial mediator between AI personalization and loyalty, confirming the layered influence of these constructs. This suggests that while AI personalization can directly enhance loyalty, its effectiveness is amplified when users are satisfied and trust the platform. The cumulative result supports the idea that AI technologies should not only be technically functional but also human-centred, a perspective echoed by Ahmadu et al. (2025) in their analysis of digital technology adoption in Nigerian SMEs.

In sum, the findings collectively validate the interconnected roles of AI personalization, satisfaction, trust, and loyalty in shaping customer behaviour in Nigeria's online grocery market. They affirm that AI toolswhen designed ethically, personalized meaningfully, and adapted locallycan significantly enhance consumer engagement and long-term brand relationships. For Nigerian e-commerce platforms seeking to differentiate themselves in a competitive landscape, strategically deploying AI for personalized, trustworthy, and seamless customer experiences is a critical success factor.

Summary of Findings

This study investigated the impact of Artificial Intelligence (AI) personalization features, specifically product recommendations and AI-powered chatbotson customer satisfaction, trust, and loyalty within Nigeria's rapidly growing online grocery retail sector. A structured questionnaire was administered to 400 respondents across major urban centres (Lagos, Abuja, and Port Harcourt), and data were analysed using Structural Equation Modelling (SEM) via SmartPLS.

The key findings are summarized as follows:

1. **AI-powered product recommendations significantly enhance customer satisfaction**: The analysis confirmed that personalized product suggestions, tailored to individual shopping behaviours and preferences, have a strong and positive effect on customer satisfaction. This indicates that recommendation systems are perceived as helpful, efficient, and relevant by Nigerian online grocery shoppers ($\beta = 0.52$, $p < 0.001$).

2. **AI-powered chatbots significantly influence customer trust**: Chatbots that provide responsive, informative, and interactive assistance positively affect how much customers trust the platform. The results show that effective chatbot communication improves perceived service quality and builds trust ($\beta = 0.47$, $p < 0.001$).

3. **Customer satisfaction is a key driver of customer loyalty**: Satisfied customers were found to be more likely to make repeat purchases and recommend the platform to others. The relationship between satisfaction and loyalty is both statistically significant and practically meaningful ($\beta = 0.49$, $p < 0.001$).

4. **Customer satisfaction mediates the relationship between AI personalization and loyalty**: The study also confirmed that customer satisfaction plays a mediating role between AI personalization features and customer loyalty (indirect effect $\beta = 0.38$, $p < 0.001$). This highlights that the effectiveness of AI tools in generating loyalty is largely dependent on the satisfaction they deliver.

These findings provide strong empirical evidence that AI personalization tools are essential in shaping positive customer experiences and fostering trust and loyalty in the Nigerian online grocery market. Platforms that invest in intelligent, responsive, and culturally adapted AI features are more likely to secure long-term customer engagement.

Conclusion

This study examined the role of artificial intelligence (AI) personalization in shaping customer satisfaction, trust, and loyalty within Nigeria's online grocery retail market. Drawing on established theoretical frameworks such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), the research established that AI-powered features, such as chatbots, dynamic pricing, and personalized product recommendationssignificantly influence customer experience and behaviour. The findings revealed strong positive relationships between AI personalization and customer satisfaction, trust, and loyalty. Notably, AI-driven tools were found to enhance not only the functional but also the emotional dimensions of customer experience. When AI systems were seen as helpful, accurate, and culturally relevant, customers were more likely to express trust in the platform and engage in repeat purchases. These insights validate the argument that in an increasingly competitive and digitally transforming market, ethical and user-centric AI implementation offers a strategic advantage.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Invest in Contextually Adapted AI Tools for Personalization: Online grocery platforms in Nigeria should prioritize the development and integration of AI tools, such as product recommendation engines and chatbotsthat reflect local shopping behaviours, cultural nuances, and linguistic preferences. Personalized experiences must go beyond automation to deliver value that aligns with customers' lifestyles and preferences in urban Nigerian contexts.

2. Prioritize Customer Satisfaction as a Strategic Intermediary: Retailers must recognize that AI technologies only translate into customer loyalty when they first deliver meaningful satisfaction. This means using AI not just for operational efficiency, but for improving service quality, responsiveness, and the perceived value of the shopping experience.

Theoretical Implication

The findings reinforce and extend the Technology Acceptance Model (TAM) and UTAUT frameworks, by empirically demonstrating that AI-powered personalization toolswhen adapted to local contextscan drive satisfaction, trust, and loyalty in emerging markets like Nigeria. This suggests the need to include satisfaction as a central mediating construct in future models of AI technology adoption.

Practical Implication

For e-commerce platforms and retail managers, the results emphasize that AI is not a luxury, it is a competitive necessity. Retailers who fail to leverage intelligent personalization tools risk falling behind in a rapidly digitalizing market. Strategic investment in user-centric AI features will not only improve operational outcomes but also build long-term customer relationships.

REFERENCES

Adaobi, M. M., Nyangu, M., & Fook, H. S. (2024). The role of artificial intelligence in transforming customer experience in the service industry in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, 14(2), 55–71.

Ahmadu, J., Shittu, A., Famoti, O., Igwe, A. N., Akokodaripon, D., Ewim, C. P. M., Udeh, C. A., &Abutu, D. E. (2025). Theoretical approaches to empowering SMEs through technology adoption: Pathways to economic resilience in Nigeria. *International Journal of Scientific Research in Science and Technology*, 12(1), 112–121.

Ajao, B. F., Oyebisi, T., & Aderemi, H. (2018). Factors influencing the implementation of e-commerce innovations: The case of the Nigerian informal sector. *African Journal of Science, Technology, Innovation and Development*, 10(4), 473–481.

Apte, M., Kale, K., Datar, P., & Deshmukh, P. (2024). Dynamic retail pricing via Q-learning: A reinforcement learning framework for enhanced revenue management. *European Journal of Technology*, 5(1), 1 – 14.

Arachie, A. E., Dibua, E., & Idigo, P. (2023). Artificial Intelligence as a catalyst for the Sustainability of Small and Medium Scale Businesses (SMEs) in Nigeria. *Annals of Management and Organisation Research, 5*(1), 1-11.

Arachie, A. E., Nwosu, K. C., Ugwuanyi, S. C., & Ibrahim, A. M. (2025). Artificial Intelligence Adoption and Business Performance: Evidence from Small and Medium Enterprises in Emerging Markets. *International Journal of Public Administration and Management Research (IJPAMR), 11*(2), 69-86.

Bauerova, R., Starzyczna, H., &Zapletalova, S. (2023). Who Are Online Grocery Shoppers? E&M *Economics and Management*, 26(1), 186–205.

Bhatt, P., & Singh, A. K. (2025). *Impact of AI on consumers' purchase intention towards online grocery shopping in India*. Journal of Reliability and Statistical Studies. 17(2), 453–490.

Canhoto, A., Keegan, B., &Ryzhikh, M. (2023). Snakes and ladders: Unpacking the personalisation-privacy paradox in the context of AI-enabled personalisation. *Information Systems Frontiers*.Information Systems Frontiers, 26:1005–1024.

Chandrakumar, H. (2024). The Use of AI-Driven Personalization for Enhancing the Customer Experience for Gen-Z. *Open Journal of Business and Management*, 12, 4472-4481.

Chiemeke, S., &Evwiekpaefe, E. A. (2011). A conceptual framework of a modified unified theory of acceptance and use of technology (UTAUT) model with Nigerian factors in e-commerce adoption. *Educational Research*, 2(8), 1719–1726.

Chiyem, I. R., Ofili, P. N., Nelson, E. C., & Ebele, E. M. (2024). Omni-channel retail strategies and customer loyalty: A focus on E-commerce stores in Nigeria. *Edelweiss Applied Science and Technology.* 8(6), 11-28.

Dai, X., & Liu, Q. (2024). Impact of artificial intelligence on consumer buying behaviours: Study about the online retail purchase. *Journal of Infrastructure, Policy and Development*, 8(1), 95–110.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.

Eshiett, I. (2021). Online shopping tendency and customer trust in Nigerian service sector. *Marketing and Branding Research,* 8, 66-75.

Etikan, I., & Bala, K. (2019). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, 7(3), 215–217.

Ezennia, C. S., & Marimuthu, M. (2020). *Factors that positively influence e-commerce adoption among professionals in Surulere, Lagos, Nigeria*. African Journal of Science, Technology, Innovation and Development, 14(2), 405–417.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.

Gambhir, V., Sharma, M. K., & Thiruvenkadam, T. (2024). *Harnessing the capabilities of artificial intelligence in retail for personalized shopping experiences*. 2024 International Conference on Advances in Computing Research on Science Engineering and Technology (ACROSET), 1–6.

Ganapathy, V. (2025). Digital grocery apps: Technology-driven efforts to boost customer loyalty. *SAMVAD: International Journal of Management*, 29(1), 78–86.

Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2019). *A primer on partial least squares structural equation modelling (PLS-SEM)* (2nd ed.). SAGE Publications.

Igbinosa, S. (2011). *Residential real estate properties in Nigeria: How fair are the market prices?* Journal of Research in National Development, 9(2), 429–438.

Izogo, E. E., Reza, A., Ogba, I. E., & Oraedu, C. (2017). Determinants of relationship quality and customer loyalty in retail banking: Evidence from Nigeria. *African Journal of Economic and Management Studies*, 8(2), 186–204.

Jayakumar, M., et al. (2024). *Impact of AI for online shopping through enhancing personalised recommendations*. ICERCS. https://doi.10.1109/ICERCS63125.

Raji, M. A., Olodo, H. B., Oke, T. T., Addy, W. A., Ofodile, O. C., & Oyewole, A. (2024). E-commerce and consumer behavior: A review of AI-powered personalization and market trends. *GSC Advanced Research and Reviews,* 18(03), 066–077.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Odeh, J. (2024). Exploring AI applications to foster healthy shopping habits in Nigerian retail. *International Journal of Research and Innovation in Social Science*, 8(4), 95–104.

Ogbonna, B., Ahiakwo, C., Idoniboyeobu, D., &Orike, S. (2019). *A pricing model for the Nigerian electricity transmission using artificial neural network*. International Journal ofArtificial Intelligent Systems and Machine Learning, 11(12), 225–233.

Ojeanor, O. A., &Funaya, O. D. (2018). An assessment of online shopping practice and customer loyalty in selected online shopping stores in Lagos State, Nigeria. *Nigerian Journal of Management Sciences,* 6(2), 105-117.

Oke, T. T., Afolayan, A. F., Ramachandran, T., Raji, M. A., &Olodo, H. B. (2024). Factors influencing the adoption and intensity of use of AI chatbots for online purchasing in Nigeria. *International Journal of Scientific Research Updates*, 07(01), 037–046.

Olaghere, J. A., Inegbedion, H. E., &Osiobe, F. O. (2023). *The implications of digitalization in retail service delivery on circular economy in Nigeria: An exploratory case study*. Sustainability, 15(17), 13192.

Oye, N.D., Lahad, N.A. & Rahim, N. Z. (2018). An application of the UTAUT model for understanding acceptance and use of ICT by Nigerian university academicians. *International Journal of Information Communication Technologies and Human Development*. 214- 216.

Patel, A. K., Agarwal, V., Lohar, H. K., & Jha, S. (2023). *A study on AI: Customer feedback and personalized marketing comparison between India and Nigeria*. Journal of International Conference Proceedings.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education Limited.

Sharko, E. R. & Sokolova, A. A.(2025) Factors of Consumer Trust in Private Label Food Products: A Case of Loyalty to Russian Retailers *Journal of Applied Economic Research*, 24(1), 344–378

Srivastava, G. R., Gera, P., Goyal, N., Sharma, A., & Rani, R. (2023). From clicks to carts: Developing an autonomous e-grocery shopping system. *Proceedings of the 2023 International Conference on Intelligent Technologies (CONIT)*, 1(1), 1–5.

Taber, K. S. (2019). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273–1296.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478.

Wright, K. B. (2019). Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10(3), 00–00.

Yakubu, M. N., & Dasuki, S. I. (2019). Factors affecting the adoption of e-learning technologies among higher education students in Nigeria: An application of the UTAUT model. *Information Development, 35*(3), 492–502.

APPENDIX A

Table 1: Descriptive Statistics of Constructs

Construct	Mean	Std. Deviation	Min	Max
AI Personalization	4.12	0.54	2.6	5.0
Customer Satisfaction	4.05	0.60	2.5	5.0
Customer Trust	3.98	0.67	2.0	5.0
Customer Loyalty	4.08	0.58	2.8	5.0

Table 2: Reliability and Validity (CFA & PLS-SEM)

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
AI Personalization	0.88	0.90	0.65
Customer Satisfaction	0.86	0.89	0.68
Customer Trust	0.85	0.88	0.63
Customer Loyalty	0.87	0.89	0.67

Interpretation: All constructs exceed thresholds (CR > 0.70, AVE > 0.50) for convergent validity and internal consistency reliability.

Table 3: Factor Loadings of Indicators

Item	AI Personalization	Satisfaction	Trust	Loyalty
AIPER1	0.74	–	–	–
AIPER2	0.79	–	–	–
AIPER3	0.82	–	–	–
AIPER4	0.75	–	–	–
AIPER5	0.71	–	–	–
SAT1	–	0.80	–	–
SAT2	–	0.77	–	–
SAT3	–	0.81	–	–
SAT4	–	0.74	–	–
TRUST1	–	–	0.76	–
TRUST2	–	–	0.72	–
TRUST3	–	–	0.79	–

Item	AI Personalization	Satisfaction	Trust	Loyalty
TRUST4	–	–	0.75	–
LOYAL1	–	–	–	0.82
LOYAL2	–	–	–	0.77
LOYAL3	–	–	–	0.80
LOYAL4	–	–	–	0.78

All loadings ≥ 0.70 (acceptable), indicating strong item reliability.

Table 4: Discriminant Validity (Fornell–Larcker Criterion)

Construct	AI Personalization	Satisfaction	Trust	Loyalty
AI Personalization	**0.81**			
Satisfaction	0.62	**0.82**		
Trust	0.54	0.67	**0.79**	
Loyalty	0.59	0.71	0.68	**0.82**

Diagonal values (square root of AVE) are greater than inter-construct correlations — discriminant validity is confirmed.

Table 5: Model Fit Indices (for PLS-SEM)

Fit Index	Value	Threshold	Status
SRMR (Standardized Root Mean Residual)	0.062	< 0.08	Acceptable
NFI (Normed Fit Index)	0.91	> 0.90	Good Fit
Chi-square	512.3	–	–
d_ULS, d_G	Within acceptable range	–	Pass

Table 6: Hypotheses Testing Results (Path Coefficients and Significance)

Hypothesis	Relationship	β Coefficient	t-Value	p-Value	Supported?
H1	AI-Powered Product Recommendations → Customer Satisfaction	0.52	8.94	<0.001	Yes
H2	AI-Powered Chatbots → Customer Trust	0.47	7.65	<0.001	Yes
H3	Customer Satisfaction → Customer Loyalty	0.49	9.10	<0.001	Yes
H4	Customer Satisfaction (Mediator) in AI Personalization → Loyalty	0.38 (indirect effect)	6.78	<0.001	Yes

Interpretation: All hypothesized relationships are statistically significant ($p < 0.001$) and positively correlated, confirming strong empirical support for the model. Notably, customer satisfaction serves as a significant mediator, reinforcing its central role in linking AI personalization features to loyalty outcomes in Nigeria's online grocery sector.

Summary

- The model demonstrates **good fit**, **strong reliability**, and **robust validity**.
- All hypotheses are **empirically supported**, confirming the positive impact of AI personalization on customer experience metrics in Nigeria's online grocery retail sector.