



Exploring Artificial Intelligence integration in mortgage financing solutions: A study of non-interest banks in Nigeria

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ABSTRACT

Purpose - Previous studies have mainly discussed artificial intelligence (AI) in the context of countries such as Britain, the United States and China, with limited research in the context of developing world like Nigeria. This study therefore explores AI integration in mortgage solutions among non-interest banks in Nigeria.

Design/Methodology/Approach - The study adopts a qualitative research design focused on four full-fledged Islamic banks in Nigeria; Jaiz, TAJ, LOTUS and Alternative Bank. It uses purposive sampling techniques, with primary data gathered through semi-structured interviews with the heads of the Corporate Banking, Risk Management, Compliance/Mortgage and Marketing Departments. NVivo 14 software was used for analysis.

Findings - The findings show that non-interest banks face inadequate manpower, particularly in AI technology, which hinders its integration into mortgage solutions. Other challenges include trust issues, access to collateral security, and low levels of technology adoption. The study recommends using current technologies to support AI-enabled mortgage solutions.

Originality/Value - The study contributes to the limited literature on AI integration in non-interest banking and Islamic banking solution in Nigeria.

Research limitations/Implication - The study is limited to selected non-interest banks and is interview-based. Future studies may consider mixed-methods approaches and extend the scope to customers and regulators.

Practical Implications - The findings suggest that non-interest banks should strengthen digital infrastructure, build AI capacity and design technology-driven infrastructure.

Keywords - Artificial intelligence; mortgage; non-interest banks; financial inclusion; mortgage solutions

Article Classification - Research Paper

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INTRODUCTION

AI has significant potential to enhance productivity in Nigeria, but its success depends on meeting human needs and aligning with organizational culture (Edema, 2024). Nigeria's banking sector is undergoing major transformation (Gyau, 2024) with the introduction of artificial intelligence (AI). Non-interest banks in Nigeria are using AI technology to realise benefits such as improved customer service, efficiency and automation, enhanced security, optimized risk management, personalised banking experiences, cost savings and stronger

competitive advantage. Other potential benefits include improved compliance and regulatory adherence through AI-enabled reporting tools; intelligent data analytics for market-trend prediction; and greater opportunities for employees to focus on creative tasks rather than routine activities that can be automated. It is necessary to assess AI readiness before adopting AI technology in banking. Nigerian banks are implementing AI to remain competitive in the sector (Edem, 2024).

AI has transformed many sectors, particularly banking, in the Global North, while many African countries still lack national AI strategies or substantial levels of AI readiness (Accenture, 2024). AI is already reshaping banking operations, from customer service to security measures to innovations. Banks in Nigeria, especially well-resourced institutions such as JAIZ, LOTUS, Alternative Bank, and TAJ banks are using AI technology to obtain a range of operational and strategic benefits (Actuarial Association of Europe, 2024).

In summary, Nigerian banks are using AI to maximise benefits that include improved risk management, efficiency in credit analysis and approval processes, personalised customer experience, cost efficiency, profitability, competitive advantage, regulatory compliance and market analysis. One of the greatest benefits of AI adoption for Nigerian banks is its ability to improve customer service. For instance, AI chatbots can generate instant and tailored responses to customer queries, thereby improving the customer experience (Bank of England, 2024). Chatbots can manage many simultaneous customer inquiries and provide fast, efficient responses around the clock. For example, when a customer inquires about their account balance, a chatbot can use the customer's transaction history and query to deliver prompt information without human intervention. This not only increases customer satisfaction but also frees bank employees to perform more complex tasks that require human judgment.

AI also streamlines repetitive tasks such as data entry, document processing, and verification, enabling bank staff to spend more time on higher-value tasks. Automating routine tasks allows banks to serve customers more efficiently and process mortgages more quickly (Arner et al., 2020). AI algorithms can also analyze customer data to provide personalized product recommendations and services that enhance customer satisfaction and loyalty. AI can therefore improve customer service and contribute to financial inclusion by reaching underserved populations (Center for Security and Emerging Technology, 2024).

Moreover, security is paramount for banks and AI does provide a strong security mechanisms in non-interest banks operating in Nigeria. AI systems can scan large volumes of data in real-time to identify fraudulent activities and other threats, such as unauthorised transactions or identity theft, as the financial sector faces increasing cyber risks. Through AI-driven risk management systems, AI detects unusual patterns and notifies the bank's security team to follow up. This preventive measure assists banks in minimizing financial losses and safeguarding customer data from cyber threats (Aldasoro et al., 2024).

In addition, the adoption of AI by non-interest banks in Nigeria improves the analysis of big data to check for potential risks and allow for more accurate decision-making, thereby helping banks reduce possible losses. Banks are now able to reduce credit risks, identify transactional anomalies and forecast market trends through advanced AI algorithms. For example, AI-driven risk management systems can analyze past behavior to recognize patterns of default and predict how likely it is that a customer will default on an unsecured credit line. Such proactive risk assessment allows banks to act accordingly to reduce exposure to potential risks (Barakova et al., 2021). However, while there have been several studies on non-interest banks in Nigeria, none of the research works focuses on AI in non-interest banks in Nigeria. Hence, this study intends to bridge the gap.

Concept of Artificial Intelligence

The phrase artificial intelligence was first used in the 1950s. Since then, scientists have attempted to design systems capable of executing tasks that require cognitive skills and semi-autonomous operations (Aldasoro et al., 2024). AI has become increasingly popular because it supports advanced decision-making, automation, and operational efficiency. In banking, AI supports improvements in risk assessment, customer service, fraud detection, process automation. In short, AI seems to have taken flight with irreversible consequences for society.

Through big data and AI, banks can analyse customer data to provide personalised product recommendations and services that improve satisfaction and loyalty. Banks can customize their services based on customer behaviour, preferences, and financial requirements. For example, AI algorithms can analyse a customer's spending patterns and suggest personalised investment options or insurance products that may complement these financial goals. This personalised approach not only improves customer experience but also builds long term relationships with customers (Center for Security and Emerging Technology, 2024).

AI can help banks reduce operating costs and improve profit and loss outcomes by automating processes and improving efficiency. AI-driven solutions can automate processes, remove unnecessary tasks and help allocate resources more effectively resulting in lower expenses. For instance, banks can decrease manual errors and operational costs (Hamadou, 2024) by automating back-office processes like data entry and reconciliation. On the other hand, AI can be used by banks to optimise their marketing strategies through targeting the right audience with personalised offers, generating higher conversion rates and ultimately revenue.

Early adopters of AI in banking can provide advanced services and improve customer satisfaction, thus gaining a competitive advantage in the industry (Lazo & Ebardo, 2022). In doing so, banks can stand out from competitors by improving customer service, increasing efficiency and personalizing banking experience with the help of AI capabilities. By leveraging technology to meet the evolving needs and preferences of consumers, banks can create a unique selling proposition that sets them apart in the market and serves the technologically challenged customers via AI-human cohabitation. This competitive edge enables banks not only to retain customers but also attract new ones, contributing to growth and profitability (Alahmad, 2023)

AI tools can help banks validate compliance with requirements from the Central Bank of Nigeria (CBN), the NDIC, and other parties. Regulatory compliance is an important part of banking operations, and failure to comply can result in heavy fines. Intelligent systems can also conduct real-time analysis on transactions while inherently triggering alerts for suspicious behaviour and generating reports as required by the regulatory agencies. Banks need to streamline compliance processes; through automation they can reduce the risk of non-compliance as well.

AI can analyse data at scale to provide insights that drive better business decisions and growth strategies for banks. Banks can harness AI algorithms to analyse customer data, market trends, and financial indicators that reveal actionable insights for strategic decision-making. For example, AI-driven analytics tools may pinpoint customers with high profitability potential, so that banks can target their marketing efforts more effectively. Using data analytics, banks can optimise their operations, enhance customer engagement and accelerate growth.

AI adoption can enable innovation in banking, where new services and products that create value for customers and the bank are created (Boussaadia, 2025). The use of AI technology can enable Nigerian banks to adopt innovative solutions like robo-advisors, predictive analytics, and virtual assistants that make a significant difference in the customer experience. By way of example, robo-advisors that offer automatic investment suggestions based on clients' risk appetite and investment preferences have streamlined wealth

management. Innovation becomes part of a bank's institutional image, making it an industry leader attracting tech-centric customers who appreciate pioneering solutions.

The substantial financial commitments involved in acquiring and executing AI technology in the short term may be a significant hurdle for some, if not all, banks. However, when AI is deployed appropriately, it may generate long-term benefits in terms of efficiency, profitability, customer service and financial inclusion. Therefore, banks must balance the short-term costs of AI adoption with its long-term strategic value.

Table 1: Development of AI

Year	Development of AI
2016	Microsoft brings out Tay, an AI bot that learns from human behaviour on social media. Within a few hours, Tay begins producing offensive and harmful posts.
2017	Sophia, a robot created by Hanson Robotics, speaks at a conference in Saudi Arabia and is granted citizenship
2018	CEO Sundar Pichai demonstrates Google Duplex, an AI assistant whose voice is claimed to be indistinguishable from a human voice and which can perform tasks such as making dinner reservations
2019	IBM's Project Debater debates Harish Natarajan on subsidizing nursery schools. Following the debate between human and machine, the judges pronounce Natarajan the winner.
2020	<i>The Guardian</i> publishes an essay written by GPT-3, a language generator developed by OpenAI, in which it argues that humans need not feel threatened by AI.

Source: Adapted from Sheikh et al., (2023)

Theoretical Framework

Technology Acceptance Model (TAM)

TAM started as a theoretical model to explain how users accept and use new technology. According to the model, users are influenced by several variables when determining how and when they will use a technology. Originally developed by Fred Davis in 1986, the Technology Acceptance Model (TAM) is a modified version of the Theory of Reasoned Action (TRA).

TAM includes several fundamental constructs, namely;

1. Perceived Usefulness: The extent to which an individual believes that using a particular system would improve their job performance.
2. Perceived Ease of Use: The extent to which an individual believes that using particular system will be free of effort.

Perceived usefulness (PU) and perceived ease of use (PEOU) influence behavioral intention to use a system. When users believe that a system is useful and easy to use, they are more likely to develop a positive attitude toward the system and a stronger intention to use it.

Actual System Use: Actual system use is the outcome that TAM seeks to predict and explain. Behavioral intention to use a system increases the likelihood of actual system use. The Technology Acceptance Model (TAM) provides an important foundation for theorizing user acceptance of technology. Although the framework helps predict and explain user interaction behavior, context-specific models are often required to account for additional variables.

In this study, TAM is used to interpret the adoption of AI-enabled mortgage solutions in non-interest banks in Nigeria. Perceived usefulness is reflected in whether bank staff and customers believe that AI can improve mortgage processing, customer assessment, risk management, documentation review, service speed, and financial inclusion. Perceived ease of use is reflected in whether AI-enabled mortgage platforms are considered simple, accessible,

affordable, transparent, and compatible with the existing capacity of non-interest banks and their customers. Behavioural intention to use AI is influenced by trust, awareness, regulatory support, availability of skilled manpower, and the strength of digital infrastructure. Therefore, the TAM framework provides a useful basis for connecting the study's findings on manpower, technology, documentation, trust, awareness, regulation, and institutional capacity to the recommendations proposed for improving AI integration in Islamic mortgage solutions.

RESEARCH METHODOLOGY

This study employs a qualitative research design. Research design is an essential element of qualitative research because it influences how phenomena are understood and described. Qualitative designs focus on in-depth understanding of complex social phenomena or processes. The study focuses on four full-fledged Islamic banks in Nigeria i.e Jaiz, TAJ, LOTUS and Alternative Bank. The population of the study consists of management staff in these banks. However, the study focuses specifically on the Corporate Banking, Risk Management, Compliance and Marketing Departments which are directly concerned with mortgage activities. Thus, it consists of the heads of these departments in four banks (16 respondents) as the study's main unit of analysis. Fifteen of these respondents participated in the interviews and served as key informants for the study.

The study uses the purposive sampling method. Purposive sampling (also known as judgmental or selective sampling) is an important research technique because it allows researchers to focus on particular groups or individuals who possess the characteristics needed to address the research objectives. This approach is especially useful when researchers seek to obtain rich information about a specific phenomenon or when the entire population cannot be accessed. Primary data were collected through semi-structured interviews with the heads of Corporate Banking, Risk Management, Compliance/Mortgage and Marketing Departments in Jaiz, TAJ, LOTUS and Alternative Bank. These interviews were conducted to capture respondents' perceptions of mortgage management in the Islamic banking context. The intention was to streamline the question-and-answer process while exploring challenges, strategies implemented and creativity created in their domain. The use of semi-structured interviews enabled in-depth insights and flexibility engagement.

Data management and analysis were performed using NVivo software. Using a qualitative data analysis programme facilitated efficient coding, organisation of the data and sequential development of themes to increase rigor and transparency in the qualitative analysis. Also, Microsoft Word and Excel were employed to perform the transcription and basic organization of data imported into NVivo software.

DATA ANALYSIS

Figure 1 presents the word cloud illustrating the words most frequently used by the informants. The word cloud represents the initial stage of data analysis in NVivo, and its purpose is to determine patterns and directions in how informants discussed the exploration of artificial intelligence for financial inclusion through mortgages. The informants repeatedly mention some key words such as collateral, market for mortgages etc. These frequently used words informed the development of themes as well as the child nodes or sub-themes in line with the research questions.

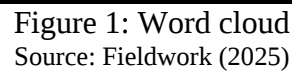


Figure 2 presents the theme of challenges faced in adopting AI for Islamic Mortgage Products. The interviews show that informants discussed several challenges including inadequate manpower, bank requirements, cost of mortgage production, security, liquidity management, the size of Islamic banks in Nigeria, inadequate awareness, trust issues, land grabbing, long-term investment, technology, inadequate income, financial problem and regulatory obstacles.

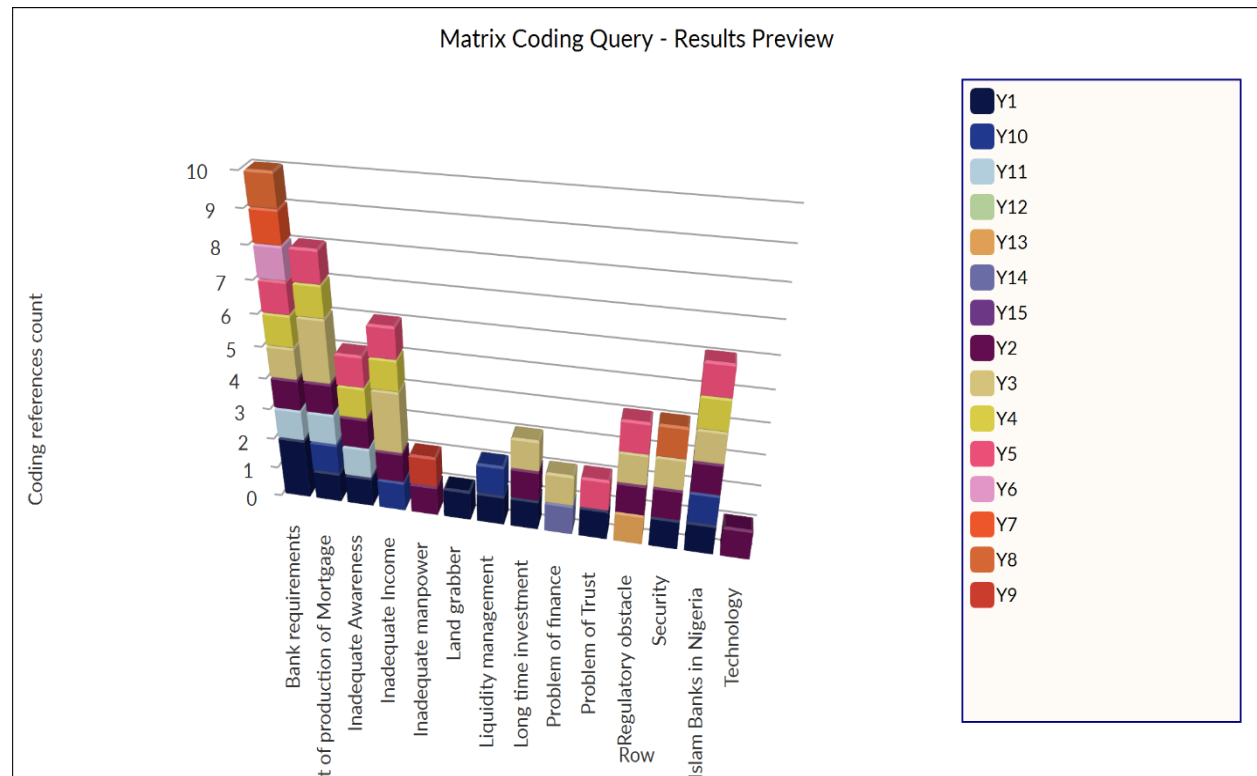


Figure 3: Matrix coding for challenges faced in adopting AI
Source: Fieldwork (2025)

Figure 3 above presents the matrix coding for the challenges faced in adopting AI for Islamic mortgage products with Bank requirements and cost of mortgage production having the highest number of quotations, followed by inadequate income. Therefore, bank requirement is the most pressing issue affecting mortgage financing in Nigeria indicated by most respondents and color coding as shown in the key.

Table 2: Cross tab on the challenges of AI in non-interest banks in Nigeria

File	Bank = JAIZ (4)	Bank = Alternative (4)	Bank = TAJ (4)	Bank = LOTUS (3)	Total (15)
Challenges faced in adopting AI	0%	0%	0%	0%	0%
Bank requirements	8.7%	36.36%	10%	16.67%	16.13%
Cost of production of Mortgage	13.04%	9.09%	10%	16.67%	12.9%
Inadequate Awareness	4.35%	9.09%	10%	11.11%	8.06%
Inadequate Income	13.04%	9.09%	10%	5.56%	9.68%
Inadequate manpower	8.7%	0%	0%	0%	3.23%

Land grabber	0%	0%	0%	5.56%	1.61%
Liquidity management	0%	0%	0%	11.11%	3.23%
Long time investment	8.7%	0%	0%	5.56%	4.84%
Problem of finance	4.35%	0%	10%	0%	3.23%
Problem of Trust	0%	0%	10%	5.56%	3.23%
Regulatory obstacle	8.7%	0%	20%	0%	6.45%
Religious factor	8.7%	18.18%	10%	5.56%	9.68%
Security	8.7%	9.09%	0%	5.56%	6.45%
Size of Islam Banks in Nigeria	8.7%	9.09%	10%	11.11%	9.68%
Technology	4.35%	0%	0%	0%	1.61%

Source: Fieldwork (2025)

The findings from the study, as presented in Table 2, reveal a diverse range of challenges facing the adoption of Artificial Intelligence (AI) in mortgage solutions across non-interest banks in Nigeria, including JAIZ, Alternative, TAJ, and LOTUS Bank. Notably, all respondents reported no direct challenges specifically attributed to AI adoption (0%), suggesting that perceived obstacles are indirect or systemic. Among the most frequently cited challenges were bank-specific requirements (16.13%), cost of mortgage production (12.9%), and inadequate income levels (9.68%). Additionally, religious factors and the limited size of Islamic banks in Nigeria each accounted for 9.68% of responses, indicating structural and socio-cultural influences. Other significant issues included inadequate awareness (8.06%), regulatory obstacles (6.45%), and security concerns (6.45%). Lesser-cited challenges such as land grabbing, technology limitations, and trust issues also emerged but with lower frequencies. These results suggest that AI integration into mortgage solutions is influenced less by AI itself and more by broader operational, institutional, and socio-economic conditions affecting non-interest banks in Nigeria.

FINDINGS AND DISCUSSION

Non-interest banks face manpower challenges, particularly shortage of skilled personnel across their branches. Other challenges include inflation and bank requirements such as certificates of occupancy, deeds of assignment, collateral, security and documentation which affect the use of AI. Some of the informants stated that “Islamic mortgage products are open to all, but the truth of the matter is that Islamic mortgage products are not accessible to all because of the documentation requirements”. Others added that; The requirements such as Certificate of Occupancy (C of O) are sometimes difficult to obtain...”

Another issue is the limited size of Islamic banks in Nigeria. Non-interest banks have branches in few major cities which affects AI adoption and mortgage outreach. Limited awareness also affects financial inclusion. These findings are consistent with Iroche (2024), who examined the challenges and prospects of non-interest banks in Nigeria. Some of the informants added that “Many Nigerians are not aware of the features of Islamic banking services, in most cases some people cannot differentiate between Islamic banking and conventional banking.”

The study also found that the cost of mortgage production is very high in Nigeria because of inflation following the removal of the fuel subsidy. The findings are also consistent with the work of (Yusuf, 2024). Other results show that the limited size of Islamic banks in Nigeria, inadequate awareness, trust issues, land grabbing, and long-term investment requirements remain important challenges.

When interpreted through the Technology Acceptance Model, these findings show that the challenges affecting AI integration in mortgage solutions are connected to both perceived usefulness and perceived ease of use. The potential usefulness of AI is evident in its ability to improve mortgage application processing, automate documentation checks, support risk assessment, strengthen customer service, and extend mortgage services beyond physical branches. However, perceived ease of use is weakened by inadequate manpower, low technology capacity, documentation requirements, collateral conditions, low awareness, and regulatory obstacles. These barriers may reduce the willingness of non-interest banks and customers to adopt AI-enabled mortgage solutions, even where such solutions are potentially beneficial. Therefore, the findings suggest that successful AI adoption depends not only on the availability of AI tools, but also on whether users perceive those tools as useful, easy to access, trustworthy, and institutionally supported.

Islamic banks in Nigeria also face low Technology adoption. Yusuf (2024) found that Islamic banks in Malaysia provide a higher level of financial inclusion than conventional banks. With education, income, and access to technology serving as significant factors. Some of the informants stated that “Because of the cost of the technology itself, the non-interest banks are finding it difficult to roll out technology that can compete with the conventional banking system.”

The analysis also found that Inadequate income affects mortgage-based financial inclusion in Nigeria. This aligns with Iroche (2024) who observed that adoption of Islamic banking system is influenced by factors such as job prospects and income levels among individuals, especially Muslims. One informant stated that; “Another challenge that we face is not something that is within the bank's control... the income of the customer... is not adequate to enable him to access this type of financing from the banks.”

The interview evidence supports this TAM-based interpretation. For example, the view that “the digitalization of the credit process makes it easier and cheaper for people to pay” reflects perceived usefulness because digital and AI-enabled systems can reduce transaction costs and improve service delivery. Similarly, the statement that customers can apply “using their mobile phone” reflects perceived ease of use because it shows how technology can reduce distance, time, and physical access barriers. However, the finding that non-interest banks struggle with “the cost of the technology itself” shows that institutional readiness remains a major condition for actual adoption. In addition, documentation requirements, collateral demands, limited awareness, and trust concerns may weaken behavioural intention to use AI-enabled mortgage platforms. Thus, the findings demonstrate that AI adoption will depend on the interaction between usefulness, ease of use, trust, awareness, and institutional capacity.

CONCLUSION

The findings show that non-interest banks are facing the problem of inadequate manpower particularly in AI technology which hinders its integration into mortgage solutions, the implication is that without adequate manpower the possibility of integrating AI into mortgage services remains low. Similarly, trust issues affect the use of AI solutions. Because collateral is central to the banking sector, limited access to collateral reduces mortgage accessibility. One informant stated that; “*The cultural obstacle is that of trust. If there are no collateral and security, the trust must be there...*”. The size of non-interest banks in Nigeria also remains limited; their activities are concentrated mainly in major state capitals, with few branches across the country. Another issue is low technology adoption, which affects AI integration and constitutes major challenge for non- interest banks in Nigeria.

The Technology Acceptance Model helps to explain why these challenges affect AI integration. The findings show that AI-enabled mortgage solutions may be perceived as useful because they can improve processing efficiency, customer assessment, digital access, and financial inclusion. However, perceived ease of use and behavioural intention may be weakened by inadequate manpower, low technology capacity, complex documentation requirements, collateral demands, trust issues, limited awareness, and regulatory constraints. Therefore, effective AI integration in non-interest mortgage solutions requires both technological investment and institutional reforms that improve usefulness, ease of use, trust, and actual system adoption.

RECOMMENDATIONS

Expand Branch Networks and Outreach

Islamic banks should prioritize expanding their branch networks, particularly in underserved rural areas, to increase access to Islamic mortgage products. Establishing physical branches in these regions will help build trust and facilitate engagement with populations that lack familiarity with Islamic banking. Where physical expansion is not feasible, banks can implement agency banking models to extend their reach. This recommendation responds to the TAM construct of perceived ease of use because wider outreach, whether physical or digital, reduces access barriers and makes AI-enabled mortgage services easier for customers to use.

Develop Tailored Products for Diverse Customer Segments

To cater to underserved populations, Islamic banks should design products tailored to the needs of specific customer groups, including informal sector workers and low-income earners. For instance, introducing financing solutions that assess cash flow rather than fixed income can make housing finance more accessible to self-employed individuals. Flexible products like *Ijara Musufa bil'ima* or partial equity-based financing models can address affordability challenges for these groups. This recommendation strengthens perceived usefulness because AI-supported customer assessment can help banks design mortgage products that better reflect customers' income patterns, especially for informal-sector and low-income customers.

Leverage Technology for Digital Transformation

Islamic banks should invest in digital platforms and mobile applications to streamline the mortgage application process, reduce transaction costs, and improve customer experience. Digitalization efforts should focus on enabling customers to apply for and manage mortgages remotely, making services accessible even in regions without physical bank branches. Digital tools can also enhance transparency and build customer trust. This recommendation directly addresses perceived usefulness and actual system use because AI-enabled mortgage platforms can improve processing speed, documentation review, risk assessment, customer experience, and service delivery, but only where banks invest in the required digital infrastructure.

Enhance Public Awareness and Education

Islamic banks should intensify efforts to educate the public about the benefits and principles of Islamic finance, particularly its inclusivity and ethical foundations. Initiatives could include targeted workshops, partnerships with religious and community leaders, and mass media

campaigns. Emphasizing the appeal of Islamic finance to both Muslim and non-Muslim populations can dispel misconceptions and foster broader adoption. This recommendation supports behavioural intention to use AI-enabled mortgage solutions because customers are more likely to adopt such services when they understand how Islamic mortgage products work and trust the transparency, fairness, and Shari'ah compliance of the process.

Introduce Hybrid Products for Greater Flexibility

To meet the diverse needs of customers, Islamic banks should develop hybrid products that combine multiple Sharia-compliant contracts, such as *Wakala*, *Ijara*, and *Murabaha*. These products can provide greater flexibility in structuring financing agreements and cater to varying financial capacities and preferences. For instance, customers could begin with deferred payments during the construction phase and transition to ownership through diminishing *Musharakah*.

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DECLARATION

Credit Authorship Contribution Statement

Sani Danjuma Ahmed: Conceptualisation, Introduction, Methodology, Data collection, Data Analysis, findings, discussion and drafting of the manuscript.

Prof. Salina Kassim: Supervision, theoretical guidance and review of the literature
Assoc. Prof Dr. Ashurov Sharofiddin: methodology refinement, interpretation of findings and critical review of the manuscripts.

Ahmad Muktar: Literature Support, technical review, editing, formatting and final proofreading of the manuscript

Declaration of Competing Interest

The authors declare that they have no known competing financial interest or personal relationships that could have influenced the research work.

Ethical Statement

The authors declare that they understand the Publication Ethics and Malpractice Statement and have adhered to all the statements. They also confirm that this paper is original and has not been published in any other journal nor is under consideration by another publication.

Data Availability

The data was obtained through semi-structured interview with selected respondents from non-interest banks in Nigeria. Due to confidentiality, the interview data is not publicly available.

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