

Artificial Intelligence and Predictive Analytics in Underwriting: Implications for Insurance Risk Assessment in Nigeria

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Cite as:

Okeke, D. C., Agbaji, B. C. & Iloegbunam, D. N. (2026). Artificial Intelligence and Predictive Analytics in Underwriting: Implications for Insurance Risk Assessment in Nigeria. *International Journal of Accounting and Financial Risk Management*, 7(2), 1-13. [10.5281/zenodo.18903677](https://doi.org/10.5281/zenodo.18903677)

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Abstract

This study examined the common link between artificial intelligence and predictive analytics in underwriting and its implications for insurance risk assessment in Nigeria. The specific objectives were to: analyze the relationship between the adoption of artificial intelligence and fraud detection in underwriting and its implications in increasing efficiency and productivity in risk assessment; examine the relationship between the adoption of artificial intelligence and policy personalization in underwriting and its predictive implications in improving customer experience in risk assessment. A survey research design was adopted. The primary source of data was utilized for the study using a structured questionnaire as a data collection instrument. The T-test technique was adopted for testing the hypotheses. Findings revealed that; there was significant relationship between adoption of Artificial Intelligence (AI) and fraud detection in underwriting and it has substantial implication on efficiency and productivity in risk assessment ($F = 1329.192$, $P_v < 0.05$); there was also significant relationship between adoption of Artificial Intelligence (AI) and policy personalization in underwriting which has predictive implication in improving customer experience in risk assessment ($F = 1409.451$, $P_v < 0.05$). Based on the findings, the study concluded that the adoption of Artificial Intelligence (AI) in the insurance underwriting process is enhancing fraud detection and policy personalization. These, in turn, have significant implications in enhancing efficiency/productivity, accuracy, and personalization across various insurance companies. The use of predictive analytics helps insurers better understand risk and provide real-time data for quotes on demand. The following recommendations were made: insurance companies in Nigeria should integrate AI and predictive analytics in underwriting complex data, and develop strong AI governance for fairness & transparency, building digital infrastructure for real-time data across the Nigerian insurance sector.

Keywords: Artificial Intelligence; Predictive Analysis; Underwriting; Insurance Risk Assessment; Fraud Detection; Policy Personalization; Customer Experience

Introduction

Artificial intelligence (AI) was a term first coined at Dartmouth College in 1956 at the Summer Research Project on Artificial Intelligence. In the modern world, we are surrounded by AI. Artificial intelligence (AI) in the realm of services typically refers to automated and robotic systems designed to assist customers in their purchasing and usage processes (Echegu, 2024; Spreitzenbarth, 2024). Artificial Intelligence (AI) is the field of computer science that focuses on creating machines and systems capable of performing tasks that normally require human intelligence (Azenkouk, *et al*, 2025). There are many examples of the implementation of artificial intelligence in everyday life, such as in Automation & Convenience, healthcare, transportation and safety (Azenkouk, *et al*, 2025). The development and spread of machine learning began to attract interest in its commercial applications by financial service companies, including the insurance industry. Hence, the relative potential benefits of AI adoption have attracted the attention of researchers in recent years in the business world, including insurance sectors (Pawan & Madhumita,

2023; Mohammed, *et al.*, 2024; Nana, *et al.*, 2024; Kumar, 2025; Kishor, 2025; Sridhar, 2025; Abongo, 2025; Malali, 2025; Shalini & MuniRaju, 2025).

Insurance operates as a form of commercial intermediation by distributing risks among all participants in a particular group, effectively mitigating potential losses (Denenberg *et al.*, 2024).

While underwriting is a risk assessment process that categorizes insurance applicants into different risk classes. Underwriters need to 'assess the risk to decide whether or not to accept the risk, or how much to accept, determine the terms, conditions and scope of cover to be offered; and calculate a suitable premium' (Chartered Insurance Institute, 2020). Insurance underwriting process is being revolutionized by the use of artificial intelligence (AI), which is increasing its efficiency and accuracy (Shalini & MuniRaju, 2025). One of the key benefits of AI is its ability to utilize predictive analytics to better understand risk and provide real-time data for quotes on demand. This allows insurers to customize policies for each customer's needs, resulting in a more personalized and effective approach to underwriting (Ravi, 2023). One of the main advantages of using AI in underwriting is that it can analyze large volumes of data more quickly and accurately than humans (Harsha, 2025). This means that underwriters can focus on strategy and portfolio management rather than spending time scrutinizing data manually. AI algorithms can perform tedious underwriting tasks more efficiently, freeing up underwriters to focus on more complex and strategic aspects of their work (Ravi, 2023).

While the adoption of AI is increasingly widespread in advance economies, its deployment is still complex, with benefits balanced by significant ethical and operational challenges in Sub-Saharan African countries. The technology is expected to transform insurance from a reactive "detection and repair" model to a proactive "predict and prevent" approach (Perumal, 2025). Despite the potential benefits of AI in the insurance sector such as increasing efficiency, improving accuracy, enhancing customer experience, and reducing costs, its adoption in Africa has been relatively slow (Kablan, 2025). Several factors, including limited technological infrastructure, data scarcity, and a lack of skilled AI talent, have hindered the widespread implementation of AI solutions. In 2024, the global AI for insurance market was valued at \$8.13 billion and is projected to reach \$141.44 billion globally by 2034, driven by a compound annual growth rate (CAGR) of approximately 33%. This technology represents a powerful catalyst—serving as a bridge between the continent's current position and its aspirational future (Enyiorji, 2025).

However, the unique characteristics of the African insurance market, such as diverse customer profiles, and prevalent fraudulent activities, necessitate tailored AI applications. Fraudulent claims continue to cost insurers substantial amounts of money each year, eroding profits and undermining customer confidence (Singh, *et al.* 2024). While AI systems are available to detect fraudulent patterns, not all firms have successfully integrated them into their operations, leading to persistent inefficiencies (Khan *et al.*, 2024). Thus, the growing interest in this area, coupled with the conflicting results from previous studies in this area calls for more investigation. It is therefore based on this background that the researchers seek to investigate link between artificial intelligence and predictive analytical in underwriting and its implications in insurance risk assessment in Nigeria.

Objectives of the Study

The main objective of the study was to investigate the relationship between artificial intelligence and predictive analytics in underwriting: implications for insurance risk assessment in Nigeria. In specific terms, the objectives of the study were to;

- i. analyze the relationship between adoption of artificial intelligence and fraud detection in underwriting and its implication in increasing efficiency and productivity in risk assessment.
- i. examine the relationship between adoption of artificial intelligence and policy personalization in underwriting and its predictive implication in improving customer experience in risk assessment.

Research Questions

The following research questions were asked to guide the study;

- i. What is the relationship between adoption of artificial intelligence and fraud detection in underwriting and its predictive implication in increasing efficiency and productive in risk assessment.
- ii. What is the relationship between adoption of artificial intelligence and policy personalization in underwriting and its predictive implication in improving customer experience in risk assessment.

Statement of Hypotheses

The following statement of hypotheses was formulated to guide the study;

- iii. The relationship between adoption of artificial intelligence and fraud detection in underwriting does not have significant predictive analytical implication in increasing efficiency and productivity in risk assessment.
- iv. The relationship between adoption of artificial intelligence and policy personalization in underwriting does not have significant predictive implication in improving customer experience in risk assessment.

Review of Related Literature

Conceptual Review

Artificial Intelligence

Artificial intelligence (AI) includes all intelligent machines that can learn, adapt, and function in various risky situations (computer systems) without needing external help (Mialhe, 2018). With each new data file, intelligent systems use complex algorithms to learn from previous performance and continually modify and improve their predictions (Hehner et al., 2017). Furthermore, machines mimic human cognitive abilities such as perception, learning, reasoning, and problem solving (Balasubramanian et al., 2018). OECD (2020) states that results can be displayed in products, social media posts, and search engine results, and the information is expected to be honest. However, when artificial intelligence (AI) and machine learning are used for commercial purposes such as online retail and recommendation systems, it does not come without raising ethical questions and criticisms (McCarthy, 2020).

Unlike natural intelligence, computers can only become more intelligent in limited areas. More generally, natural intelligence is highly adaptive, and such high levels of intelligence (often called general intelligence) cannot be transferred to machines. Artificial intelligence is described by Elaine Rich et al. (2008) as "the study of how computers do things better than they can currently do." According to McKinsey (2017), the general definition of artificial intelligence is the ability of a computer to manage and perform specific tasks quickly, effectively, and intelligently.

Artificial intelligence is also related to machine learning, since in machine learning, humans input data into a computer and the machine is assumed to be able to learn on its own (Nedelkoska and Quintini, 2018). In the field of machine learning known as "deep learning," algorithms aim to obtain a high level of abstraction of the data. Artificial intelligence is a broad field of computer science. The goal of artificial intelligence is to create intelligent autonomous systems that do not require human intervention, as exemplified by blockchain technology (Alli, Ganiyu, Aina, 2020).

Fraud Detection

Insurance fraud is a major issue for the insurance industry, manifesting in various forms such as fabricating a loss event that never occurred, deliberately creating an insured event, or exaggerating the impact of an actual insured event (Alqahtani et al., 2024). Claims handlers are crucial in identifying and addressing fraud, though detection methods can differ based on the type of insurance involved. To combat fraud, several industry bodies work to reduce its incidence and raise awareness of its detrimental effects (Wang & Pan, 2022).

Predictive Analytics

One of the most significant contributions of AI to risk management is in the realm of predictive analytics. AI algorithms, particularly those based on machine learning, can analyze vast amounts of historical data and identify patterns that may not be immediately apparent to human analysts (Singh & Gupta, 2022). By considering a variety of factors, such as past claims history, economic trends, and environmental conditions, these algorithms can predict the likelihood of future risks (Javed et al., 2022).

Insurance Underwriting

Insurance underwriting is a critical process that involves assessing risk to determine appropriate policy terms, coverage limits, and pricing. Traditionally, this process relied heavily on the expertise of underwriters and historical data. However, with the exponential growth of data and advancements in machine learning and predictive analytics, underwriting has evolved to become more data-driven. Predictive modeling leverages statistical techniques and machine learning algorithms to analyze historical and real-time data, identifying patterns that inform underwriting decisions (Mei, 2022).

Risk Assessment

Risk assessment is a term used to describe the overall process or method where of identifying hazards, assessing the risk of hazards, and prioritizing hazards associated with a specific activity, task, or job. It considers the probability or likelihood of harm from exposure and the potential consequence or severity of harm from exposure to a hazard. Risk assessment in the insurance industry is a critical process used to evaluate the potential risks associated with insuring individuals, businesses, or assets. Insurers analyze factors such as health history, driving records, property conditions, and financial stability to determine the likelihood of a claim being filed. This assessment helps insurance companies set policy terms, calculate premiums, and decide coverage eligibility (Kumar, 2025). Risk assessment is the overall process of risk identification, risk analysis, and risk evaluation (ISO 31010).

Implications Surrounding Artificial Intelligence

Artificial intelligence has developed exponentially in perception, including voice recognition, cognition, and problem-solving within the past decade. In the insurance agency, AI has been developed to “enhance large data analytics, evolve algorithms with transactional data faster, and combine data in new ways to discover better underwriting risks and appropriately price the risk of various insured’s based on the true value of their business risks” (Kelley et al., 2021). In addition to the positive transformations of the insurance sector, there have also been negative implications as a result of artificial intelligence. New technology is not cheap, and “advancements in artificial intelligence, blockchain, cloud technology, and Internet of Things (IoT) require high investment in the short term” (Kahyaoğlu, 2022). However, in the longer term, artificial intelligence is expected to produce large benefits to cost and efficiency. Its intended effect is also to bring about new insurance products, services, and business models in the longer term.

Theoretical Framework

The study was anchored on diffusion of Innovation (DOI) theory. This theory was propounded and conceptualized by Rogers in 1960. DOI Theory explains how new ideas, products, or technologies spread through social systems over time. The theory suggests that innovation adoption occurs gradually, unevenly, and is influenced by different adopter categories (Chatterjee et al., 2021; Chen & Tan, 2004). This theory is relevant for this study because it offers a fundamental framework for understanding how technological advancements like Artificial Intelligence (AI) spread within insurance industry. Although this theoretical model provides useful insights into the step-by-step process of AI adoption, its relevance in the context of AI-driven insurance business change in Nigeria insurance sector warrants a careful critique.

Nigeria insurers such as Jubilee Insurance and Britam exemplify early adopters harnessing AI to enhance customer experience and internal process efficiency (Shah, 2024). These firms display traits typical of innovators and early adopters in Rogers' framework, including high resource capacity, strategic vision, and openness to technological experimentation. However, the theory's linear adoption curve may

oversimplify the complexity of digital transformation in emerging markets, where systemic constraints and resource disparities significantly influence the diffusion pace and scope.

Empirical Review

Eling and Staubli (2020) analyzes the impact of artificial intelligence (AI) on the insurance sector using Porter's (1985) value chain and Berliner's (1982) insurability criteria. The study was based on a dataset consisting of 91 papers and 22 industry studies. The study findings showed that AI has the potential to enhance cost efficiencies and open up new revenue streams within the insurance industry. The insurance business model is expected to shift from merely compensating for losses to predicting and preventing them.

Balasubramanian et al. (2021) explored how artificial intelligence (AI) will transform underwriting and insurance pricing by 2030. The study predicted that shift to Automated Underwriting: Traditional underwriting processes will nearly disappear, replaced by AI-driven processes that complete in seconds. Machine learning models, powered by internal and external data, will design insurance products tailored to everyone's risk profile. The study further indicates that Insurers will collect data from various sources, such as reinsurers, manufacturers, and distributors.

Benjamin (2021) studied the impact of artificial intelligence and predictive analytics on insurance risk assessment in the digital age in Nigeria. This cross-sectional study examines the impact of artificial intelligence (AI) and predictive analytics on insurance risk assessment across 10 countries. Results reveal significant regional disparities, with high AI adoption and robust digital infrastructure. Regression analysis highlights AI adoption's positive impact moderated by digital infrastructure, while stringent regulations unexpectedly hindered progress.

Machireddy (2022) conducted a study on data analytics in health insurance: transforming risk, fraud, and personalized care in Nigeria. This book delves into the transformative role of data analytics in the health insurance industry. It was covered how predictive analytics, machine learning, and big data are revolutionizing traditional insurance practices, from risk assessment and fraud detection to optimizing claims processing and designing personalized health plans.

Ravi (2023) examined impact of AI in the general insurance underwriting factors in India. The paper presents the AI Based Risk Intelligence Model (RIM), which combines data analytics, machine learning algorithms, and predictive modelling to provide a comprehensive view of an insurer's risk exposure. This can result in the better risk assessment and more accurate pricing for insurance products and can also help insurers to identify reinsurance arrangements.

Pawan and Madhumita (2023) carried out a study on the impact of artificial intelligence on the insurance industry and related legal issues in India. This paper tries to analyse how AI mechanisms can be put forth in the insurance sector, where introducing the AI Act ("AIA") to govern AI has significant implications and challenges for the insurance sector. AI in Insurance is a revolutionizing business that boosts customer satisfaction in a speedy manner to clear the claim, and detection of any kind of illegal activities carried out by agent is avoided compared to human error and risk management is lesser as it provides quality information.

Mohammed, et al (2024) examined the role of artificial intelligence in risk management and underwriting optimization in the insurance industry in Nigeria. This study examines the transformative potential of artificial intelligence (AI) in enhancing these processes within Saudi car insurance sector, where traditional practices often fall short. Conventional underwriting methods tend to rely on subjective assessments and personal relationships, resulting in inconsistent pricing structures and potential financial losses for insurers. This can foster a lack of transparency and fairness in premium setting, alienating consumers and undermining trust in the insurance system.

Nana, et al (2024) examined the effect of artificial intelligence on operational performance of Nigeria Health Insurance Authority in Nigeria. For this reason, this study evaluated the effect of AI on insurance underwriting, customer service delivery, insurance claim provision, and insurance marketing. According to the study, artificial intelligence contributes to improving insurance risk underwritten, customer service delivery but has a negative impact on insurance claims processing.

Kumar (2025) studied underwriting and management risk revolutionizing: insurance healthcare in analytics Pre, insurance Data and Learning Machine in Kenya. Insurance health in management risk and underwriting revolutionizing is analytics predictive. Policy their price correctly and accuracy with events healthcare of cost the predict to insurers enable data of analysis them to patients of records medical and demographic, claims historical including data internal of volume large a analyze models and programs wellness as such, measures reducing-risk early take insurers help insights risk of patterns and trends identify underpin also analytics driven-AI.

Kishor (2025) conducted a study on artificial intelligence-driven transformation in property and casualty insurance underwriting: technologies, applications, and strategic implications in India. These systems demonstrate the capability to collect and analyze both structured and unstructured data from diverse sources, including internal databases, third-party providers, inspection reports, and broker communications. The technology enables dynamic risk scoring and classification across multiple insurance lines homeowners, commercial property, automobile, and small business while incorporating localized threat assessments for factors such as natural disasters and crime rates.

Sridhar (2025) examined leveraging machine learning and artificial intelligence for predictive analytics and risk management in life insurance product in Nigeria. This paper explored the uses of ML and AI in life insurance including predictive modeling, fraud detection, customer segmentation, and personalized risk assessment. There is evidence that AI and ML can revolutionize life insurance risk management, giving insurers the ability to predict new risks or offer more customization in their products to consumers.

Abongo (2025) assessed the impact of AI-driven internal processes on organizational performance in Kenya's Insurance Industry in Kenya. This research explores how Artificial Intelligence (AI) is transforming internal workflows within Kenyan insurance companies and, as a result, affecting overall firm performance. Key functions such as underwriting, risk profiling, premium determination, document parsing, claims automation, policy tailoring, and risk assessment are increasingly shifting to AI and Natural Language Processing (NLP) platforms. Findings show a median AI-enabled workflow adoption rate with this technological implementation currently accounting for 48.6% of the variation in performance observed among respondents.

Malali (2025) explored artificial intelligence in life insurance underwriting: a risk assessment and ethical implications in Malaysia. This research analyzes how artificial intelligence helps life insurance companies evaluate risks while showing its strengths and weaknesses in underwriting work. This research analyzes existing AI underwriting applications and examines both their better performance and ethical problems. The system demands AI algorithms that viewers can understand plus fair models, plus good leadership structures to run AI systems safely.

Shalini and MuniRaju (2025) studied insurance business and artificial intelligence in Kenya. Artificial Intelligence (AI) is the buzzword of the day in the corporate world, influencing nearly every sector and activity. The insurance industry is one such sector where AI is used to improve transparency, accountability, and efficiency for both policyholders and insurance companies. The study used secondary data to collect insight into the current state of AI implementation and its impact on claims settlement processes. The findings suggest that AI can improve the insurance sector's performance through increased transparency, expedited procedures, and minimizing fraud.

Gap in Empirical Review

Many studies were reviewed in area of artificial intelligence and predictive analytics in insurance underwriting and risk assessment in Nigeria. However, the results of these studies were found to be conflicting, which calls for further investigation. Secondly, most of the studies reviewed analyzed their data through descriptive and inferential statistical techniques, cross-sectional survey design, regression analysis, purposive and random sampling techniques respectively while the present study used T-test method to test the formulated hypotheses.

Methodology

Research Design

This study employed a descriptive survey research design to study the relationship between artificial intelligence and predictive analytics in underwriting implication for insurance risk assessment in Nigeria. Descriptive research employs observation and explanatory methods, rendering it appropriate for analyzing the attributes and behaviours of the chosen variables.

Sources of Data

The study utilized primary data directly collected by the researcher using questionnaire. The Researcher choose primary data sources for their **specificity**, survey, **control over data quality**, and assurance of **timeliness** and **relevance** to these unique research objectives.

Population of the Study

The population for this study was made up of staff of five selected insurance companies namely; Leadway Assurance, Sovereign Trust Insurance Plc, African Alliance Insurance Plc, Fin Insurance Company Ltd and Universal Insurance Plc. Total population was 127.

Sample Size Determination/ Sampling Techniques

Census technique was adopted as the sampling method to arrive at the sample size from the five selected insurance companies. Hence, the entire population of study (127) was used as the sample size of the study.

Instrument for Data Collection

The instrument for data collection was structured questionnaire. The questionnaire was divided in three sections A, B and C. Section A was designed to gather the bio-data of the respondents such as gender, educational qualification, age and work experience. While section B was designed to gather data relating to the measurement variables for the study. The questions were designed in a 5-points likert scale as follows: Strongly Agree [SA] – 5 points, Agree [A] – 4 points, Undecided [UN] – 3 Points, Disagree [D] – 2 points and strongly Disagree [SD] – 1 point.

Reliability of the Research Instrument

Reliability concerns the extent to which a measure of a research instrument is accurate and consistent. A reliability test was carried out to ascertain the consistency of the questionnaire. It is vital to do this because when scales are chosen in any study, the researcher needs to ensure that they are reliable, and that they have internal consistency. The internal consistency was calculated using a Cronbach Alpha coefficient, which measures the interrelationship between items in the questionnaire (Cortina, 1993). Therefore, Cronbach Alpha result was 0.80 which showed some level of consistency.

Methods of Data Analyses

Descriptive statistics in form of frequencies, mean and percentages were used to present and analyze the data. While the T-test technique was used to test the hypotheses. The decision rule at the 0.05 significance level is to accept the null hypothesis if $p < 0.05$.

Presentation and Analysis of Data

The data were analyzed and presented in the percentage form as shown below.

Data Presentation

Table 1: Percentage of the Questionnaire Issued and Returned

Respondents	Copies of Questionnaire Distributed	Copies Returned	Percentage Returned	Copies not Returned	Percentage not Returned
Staff	127	120	94%	7	6%
Total	127	120		7	

Source: Field Survey, 2025

Table 1 above shows that 127 copies of the questionnaire were administered to staff of insurance companies out of which 120(94%) were returned while 7(6%) were not. Therefore, the total of 120 (94%) copies of questionnaire was used for the analysis.

Analysis of Data

Analysis of Research Question 1

Table 2: Is there any comprehensive analysis of increased efficiency/productivity between fraud detection and predictive analytics in underwriting implications for insurance risk assessment in Nigeria?

Options (N =120)	SA (Freq %)	A (Freq %)	UD (Freq %)	D (Freq %)	SD (Freq %)
<i>Insurance organization currently use predictive analytics/machine learning for fraud detection in the underwriting process</i>	75 (375) 63	20 (80) 17	5 (15) 4	10 (20) 8	10 (10) 8
<i>Traditional (e.g., rule-based) methods are currently in place for identifying potential fraud at the point of application.</i>	70 (350) 58	25 (100) 21	10 (30) 8	5 (10) 4	5 (5) 4

Source: Field Survey, 2025

In the above analysis, staff were asked their opinion on whether insurance organization currently use predictive analytics/machine learning for fraud detection in the underwriting process, 75(63%) strongly agreed, 20(17%) agreed, 5(4%) of respondents were undecided, 10(8%) disagreed and 10(8%) strongly agreed that most of insurance organization currently use predictive analytics/machine learning for fraud detection in the underwriting process.

Analysis of Research Question 2

Table 3: What are the critical enhancement of AI customer/employee experience between policy personalization and predictive analytics in underwriting implications for insurance risk assessment in Nigeria?

Options (N =120)	SA (Freq %)	A (Freq %)	UD (Freq %)	D (Freq %)	SD (Freq %)
<i>AI-powered predictive analytics and policy</i>	75 (375) 63	20 (80) 17	5 (15) 4	10 (20) 8	10 (10) 8

<i>personalization work hand-in-hand to enhance the customer and employee experience in underwriting insurance</i>					
<i>Predictive analytics provides the data-driven insights that enable personalized offerings, leading to greater efficiency, accuracy, and staff satisfaction</i>	70 (350) 58	25 (100) 21	10 (30) 8	5 (10) 4	5 (5) 4

Source: Field Survey, 2025

In the above table analysis, staff were asked if AI-powered **predictive analytics and policy personalization work hand-in-hand** to enhance the customer and employee experience in underwriting insurance, 75(63%) strongly agreed, 20(17%) agreed, 5(4%) of respondents were undecided, 10(8%) disagreed and 10(8%) strongly agreed that AI-powered **predictive analytics and policy personalization work hand-in-hand** to enhance the customer and employee experience in underwriting insurance.

Test of Hypotheses

Tests of Hypothesis One

H₀₁: The relationship between adoption of artificial intelligence and fraud detection in underwriting does not have significant predictive analytical implication in increasing efficiency and productivity in risk assessment.

H_{a1}: The relationship between adoption of artificial intelligence and fraud detection in underwriting have significant predictive analytical implication in increasing efficiency and productivity in risk assessment.

Table 4: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Insurance organization currently use predictive analytics/machine learning for fraud detection in the underwriting process	Between Groups	682.539	4	170.635	1329.192	.000
	Within Groups	43.776	116	.128		
	Total	726.315	120			
Traditional (e.g., rule-based) methods are currently in place for identifying potential fraud at the point of application	Between Groups	402.417	4	100.604	1121.854	.000
	Within Groups	30.580	116	.090		
	Total	432.997	120			

a. *Dependent Variable: product availability* b. *Predictors: (Constant), Snapchat.*

The result of Analysis of Variance (ANOVA) for t-test outcome revealed (F=1329, 192, p value = 0.000 and F=1121.854, p value = .000). The result from test of hypothesis one indicated that there was significant relationship between adoption of Artificial Intelligence (AI) and fraud detection in underwriting and it has substantial implication on efficiency and productivity in risk assessment (F = 1329.192, P<0.05).

Tests of Hypothesis Two

H₀₂: The relationship between adoption of artificial intelligence and policy personalization in underwriting does not have significant predictive implication in improving customer experience in risk assessment.

H_{a2}: The relationship between adoption of artificial intelligence and policy personalization in underwriting have significant predictive implication in improving customer experience in risk assessment.

Table 5: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
AI-powered predictive analytics and policy personalization work hand-in-hand to enhance the customer and employee experience in underwriting insurance	Between Groups	415.472	4	103.868	1409.451	.000
	Within Groups	25.130	116	.074		
	Total	440.601	120			
Predictive analytics provides the data-driven insights that enable personalized offerings, leading to greater efficiency, accuracy, and staff satisfaction	Between Groups	415.472	4	103.868	1409.451	.000
	Within Groups	25.130	116	.074		
	Total	440.601	120			

Dependent Variable: product availability b. Predictors: (Constant), Snapchat

The result of Analysis of Variance (ANOVA) for t-test outcome revealed (F=1409.451, p value = 0.000 and F=1409.451, p value = .000). The result from test of hypothesis two indicated that there was significant relationship between adoption of Artificial Intelligence (AI) and policy personalization in underwriting which has predictive implication in improving customer experience in risk assessment.

Discussion of Results

Result from test of hypothesis One: The results indicated that there was significant relationship between adoption of Artificial Intelligence (AI) and fraud detection in underwriting and it has substantial implication on efficiency and productivity in risk assessment (F = 1329.192, P<0.05). This result is in agreement with the study of Benjamin (2021) who studied the impact of artificial intelligence and predictive analytics on insurance risk assessment in the digital age in Nigeria. This result also corroborates the study of Ajeleye (2024) who investigates the effect of artificial intelligence (AI) adoption on the performance of insurance companies in Nigeria and found that adoption of artificial intelligence has positive and significant effect on the performance of insurance companies in Nigeria.

Result from test of hypothesis Two: The result indicated that there was significant relationship between adoption of Artificial Intelligence (AI) and policy personalization in underwriting which has predictive implication in improving customer experience in risk assessment in Nigeria. This result corroborates the findings of Adeoye, et al. (2024) who found that AI enhances personalized recommendations throughout the insurance lifecycle.

Summary of Findings

The summary of findings from the test of hypotheses revealed that;

- i. there was significant relationship between adoption of Artificial Intelligence (AI) and fraud detection in underwriting and it has substantial implication on efficiency and productivity in risk assessment.
- ii. there was significant relationship between adoption of Artificial Intelligence (AI) and policy personalization in underwriting which has predictive implication in improving customer experience in risk assessment.

Conclusion

Based on the findings, the study concluded that the adoption of Artificial Intelligence (AI) in insurance underwriting process is enhancing fraud detection and policy personalization. These in turn has significant implication in enhancing efficiency/productivity, accuracy, and personalization across various insurance companies. The use of predictive analytics helps insurers to better understand risks during risk assessment and provide real-time data for quotes on demand. The benefits of AI include the ability to analyze vast amounts of data more quickly and accurately than humans, identify potentially fraudulent data easily, and speed up the overall underwriting process.

Recommendations

The study recommended that insurance companies in Nigeria should integrate AI and predictive analytics in underwriting complex data, and develop strong AI governance for fairness & transparency, building digital infrastructure for real-time data across Nigerian insurance sector.

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