

# Appraising Technological Resources on Sale and Distribution of Insurance Products in Nigeria: The Moderating Role of Artificial Intelligence

Osa Abraham Ehiorobo

Department of Business Administration, University of Lagos, Nigeria, E-mail: [newdawnabraham@yahoo.com](mailto:newdawnabraham@yahoo.com)

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## Abstract

*This study attempts to appraise how technology enhances the sale and distribution of insurance products in Nigeria with a view to determining if artificial intelligence plays any interactive role in this relationship. The Nigerian insurance industry has not fared well over the years due to overreliance on compulsory insurance while neglecting major aggressive marketing strategies that can improve the sale and distribution of insurance products. It is a well known fact in the insurance industry circles that the market is about 80 percent controlled by brokers while other agents and itinerant salespersons account for just 20 percent. The research is a quantitative design that utilizes the survey strategy. 235 questionnaires were administered to 15 top insurance companies in Nigeria and the Andy Hayes Process v3.3 for regression analysis was applied for data analysis. Findings from the research indicate that insurance business in Nigeria is still at a rudimentary stage and artificial intelligence is unknown to most of the companies surveyed. However, other information technology tools impact strongly on sales while there exists a weak but significant interaction between other forms of technology and artificial intelligence in boosting the sale and distribution of insurance products in Nigeria.*

## Keywords

Artificial intelligence, information technology, insurance, sales, moderation

**JEL Codes:** G22, O33

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## 1. Introduction

The sale and distribution of insurance products in Nigeria cannot be assumed to be satisfactory as the country's large population is grossly underinsured. With an estimated population of about 206 million people (Worldometer, 2020) there exists a huge market opportunity to be exploited if only the right strategies are adopted. Insurance companies in Nigeria jostle for 'already made' accounts without putting in enough efforts in business development to expand the market and create new products for new markets. The Nigerian insurance industry is, perhaps, difficult to categorize as a major contributor to the nation's gross domestic product [GDP] as it accounts for a meagre 0.12 percent (Daniel, 2014) and a penetration rate of 0.3 percent (Statistical, 2018). Insurance in Nigeria has a density level of \$6.2 with gross premium written for 2015 standing at \$1420m comprising of \$974m for general business and \$446m for life insurance (Swissre-Sigma, 2015). The sector's performance cannot be compared to what obtains in peer economies as it ranks 34<sup>th</sup> on the African continent behind such countries as South Africa with insurance penetration rate of 16.99 percent and premium income of \$46 billion.

Several reasons have been adduced by researchers for the poor performance of the insurance sector in Nigeria. For instance, the industry has created a very damaging reputation for itself through claims default and claims avoidance (Babington-Ashaye, 2014; Gbede, 2003; Ujunwa & Modebe, 2011). It is well known that consumers' perception of an industry and its activities are key determinants of its performance because every industry relies on customers to survive. If there is apathy towards given products and services by the consumers, it is most likely a consequence of negative experiences that such consumers have encountered with the operators of that industry. Olalekan (2016) opines that the objective reality of a product matters very little: what seems to matter more is the perception of the customers towards the product and the organization offering it. In a similar vein, Tennyson and Silas-Forn (2002) aver that there is a link between claims experience and fraud tolerance as most recent claimants display a more positive attitude towards the insurance industry. Technological resources have become the most significant differentiating source of gaining competitive advantage in every industry, including insurance. When an organization is focused on delivering customer value and remain competitive, it must adopt modern technology to improve its performance and strive towards enhanced customer satisfaction and retention (Pergelova, 2010). With the provision of better marketing information and customer-centric services which a good information technology infrastructure can enhance, there is a higher tendency to achieve customer satisfaction and retention. Information technology as a business enabler has drawn the attention of both academics and

practitioners in various disciplines over the years and its increasing value has also led to the huge increases in annual budgetary allocations by firms for the procurement of IT infrastructure (Abraham, 2012; Adeloju, Olowokudejo & Obalola, 2016; Mata *et al.*, 1995). Artificial intelligence which is fast becoming the new game changer in every industry has also found grounds in insurance. Although a late adopter of the ubiquitous technology, the insurance industry in many developed countries now uses AI technologies along the entire insurance value chain (Deloitte, 2017). Shabbir and Anwer (2015) argue that artificial intelligence will certainly transform how companies compete around the world which will ultimately drive corporate performance and profitability.

The scope of this research is limited to the sale and distribution of insurance products through the use of existing information technology infrastructure and the inclusion of artificial intelligence which is distinguished as a distinct novel technology in the insurance industry in Nigeria.

### 1.1. Objectives of the Study

The main objective of this research is to appraise the impact of technological resource on the sale and distribution of insurance products in Nigeria and the moderating role of artificial intelligence. Specifically, the study intends to:

- i. examine the extent to which existing technological infrastructure impacts the sale and distribution of insurance products; and
- ii. determine if artificial intelligence plays a moderating role in the relationship between other information technology infrastructure and the sale and distribution of insurance products.

### 1.2. Research questions

- i. *To what extent does information technology influence the sale and distribution of insurance products in Nigeria?*
- ii. *Does artificial intelligence play a moderating role in the relationship between other information technology infrastructure and the sale and distribution of insurance products?*

### 1.3. Research hypothesis

- i. *Ho1: Other information technology infrastructure plays no significant role in the sale and distribution of insurance products in Nigeria*
- ii. *Ho2: Artificial intelligence does not moderate the relationship between the other information technology infrastructure and the sale and distribution of insurance products.*

## 2. Literature review

### 2.1. Theoretical Underpinning: Task-Technology Fit Theory (TTF)

The task-technology fit theory was developed by Goodhue and Thompson in 1995 and it presupposes that individual performances can be significantly enhanced if the capability of the information technology system deployed by an organisation is a good match with the task to be performed (Goodhue & Thompson, 1995). The authors opine that there should be a good fit between the IT system deployed and the task that must be performed in order to enhance the performance of the user. Goodhue and Thompson (1995) developed a seven point Likert scale instrument to measure the task-technology fit made up of eight factors that include quality, locatability, authorization, ease of use, compatibility, systems reliability, timeliness and relationship with ultimate end user. Goodhue and Thompson discovered that the task-technology fit, in combination with utilisation, was able to significantly predict organisational performance improvements that were attributable to the information technology system operated by a firm.

In view of the relationship that exists between a given task and the technology in use by an organisation otherwise known as task-technology fit, there is a high likelihood for such a synergy between tasks involved in the sale of insurance products and information technology deployed with artificial intelligence playing a moderating role. When a firm intends to obtain better, faster, cheaper and more reliable data that will enable it to achieve higher efficiency and effectiveness by leveraging on its technological capabilities in providing better, cheaper and customer-oriented goods and services it must embrace the synergistic combination that information technology and artificial intelligence can offer. Consequently, the firm will not only succeed in retaining present customers by keeping them satisfied, it will also be able to go further to create new customers, make more sales and promote higher efficiency and effectiveness in the entire sales process through information technology and AI-enabled capabilities that are unmatched by rivals, hence this theory is found to be relevant to this research.

## 2.2. Conceptual review

### 2.2.1. Sales and Distribution of Insurance Products

The marketing function of the insurance sector in Nigeria has not lived up to its obligation as it has persistently left gaps of between 94 and 98 percent unfilled (Agabi, 2019; Gbede, 2003; Solodoye, 2007). The industry has not fared well in reaching out to the vast majority of the population not captured in the insurance net. A country with an estimated population of 206 million people (Worldometer, 2020) offers a huge market for products and services to thrive. However, the insurance industry in Nigeria mostly thrives on compulsory insurance as most people would rather have nothing to do with insurance firms if the government does not make it compulsory for certain transactions. The poor image the industry has created for itself is a self-inflicted injury (Gbede, 2003). Many Nigerians look at insurance companies and their staff with suspicion due to unwholesome practices by some industry players. Unnecessary delays in claims processing, claims avoidance and fraud in the entire claims management process is partly responsible for the poor image the industry has created for itself (Barbington-Ashaye, 2014).

The weak demand for insurance products in Nigeria can perhaps, be attributed to some other challenges the industry is facing apart from the image problem. Some of these challenges include symmetrical product offering, product obsolescence, touting, product intangibility, poorly trained marketing staff, rate cutting, pervasive poverty of the masses, non remittances of premium collected by agents and brokers, slow market growth and poor and corrupt regulatory activities (Gbede, 2003; Isimoya, 2013; Oghjafor, Ladipo & Rahim, 2012). For effective sales and distribution of insurance products, much needs to be done to capture more people into the insurance net. PwC (2003) opines that for proper sales and distribution management, insurance companies must ensure recourse to bancassurance. This process involves the insurance companies piggybacking on bank branches to sell insurance products. The wide branch network of most banks provides a veritable and extensive distribution channel that can reach millions of people both in rural and urban centres.

Deloitte (2017) opines that discovering new customers is the way to go. Technologies that can facilitate the acquisition of new customers will expand the market and improve insurance sector performance. Apart from technology, insurance products can easily be sold through personal selling. Nyarko (2015) sees personal selling as a paid communication which may seek to inform or persuade customers regarding the existence and benefits of a product or service. Ehiorobo (2013) opines that effective personal selling involves prospecting, qualifying opportunities, setting sales goals, planning the sales work, identifying buying needs, describing benefits and features, answering customers questions and concerns intelligently, effective communication and presentation skills, handling customer objections, efficient management of time and territory, closing the sale and rendering world class customer service. Achieving a high level of success in insurance sales and distribution involves the company developing innovative products and ensuring that the rural poor and other uninsured urban majority are captured in the insurance net. Distribution of insurance products with the aid of field salespeople covering large territories both in rural and urban centres; sales promotion and advertising campaigns for creating awareness and communicating the benefits of various insurance products and differentiating a company's products from others, help prospects in making buying decisions and serve as reminder of the continued existence of the products and services (Ehiorobo, 2013; Epetimehin, 2011; Nyarko, 2015; Tracy, 2004).

### 2.2.2. Information Technology Infrastructure (IT)

The business value of information technology (IT) is perhaps well established in every business operation and has thus become a major differentiating factor for firms jockeying for market share and competitive advantage. O'Brien (2003) avers that information technology is a system that utilises computer hardware, software, and communication networks to gather and process data for the purpose producing information for individuals and business organisations. Obradovic *et al.* (2015) argue that much of the increase in global productivity in the last decade can be attributed to improvements in information and communications technology. Several studies have been carried out to establish the strategic advantages of information technology usage in business firms. For instance, Cakmak & Tas (2012) believe that IT helps an organisation to decrease costs and increase revenues and therefore, a veritable avenue of attaining a desired level of competitive advantage. It enhances operational efficiency and changes the strategy a business may adopt to compete (McFarlan, 1984); information technology can be incorporated into the major activities of a company's value chain to create or improve sustainable competitive advantage (Porter & Millar, 1985; Singhal, 2014).

The business application of information technology has come a long way. O'Brien (2003) argues that until 1960 the function of the then existing information systems was basically transaction processing, accounting, filing, and other electronic data processing (EDP) services and later, the management information system (MIS) was added. Decision support systems (DSS) came on board in the 1970s when it was realized that the traditional MIS was no longer sufficient for certain crucial management decision requirements. From the 1980s, there came a rapid development of microcomputers with high

processing or computing power, various application software packages and highly improved telecommunications networks. This gave birth to executive information systems (EIS) which was meant to replace the rather complex decision support systems (DSS). The final breakthrough in information technology application to business came with the development of artificial intelligence (AI) and with it are other ancillaries like expert systems (ES) and a plethora of other knowledge-based systems that now form the basis of modern management decision-making capabilities.

O'Brien (2003) opines that information technology is capable of changing the way companies compete by using information technology strategically as a means of organisational renewal, and an investment that enables an organisation to craft strategies and business processes that enables it to reengineer or reinvent itself to compete favourably in the marketplace. In this regard information technology, if properly applied can be deployed to achieve considerable cost leadership, durable differentiation, growth, innovation and strategic alliance.

### 2.2.3. Information Technology and the Sale of Insurance Products

Information technology can be applied to automate the various nodes in the insurance industry value chain. Value chain activities are those fundamental activities that add value to an organisation's products and services for customers and create a margin for the organisation (Porter, 1985). Sales and distribution is a major area of the insurance value chain where information technology can prove beneficial as online point-of-sale, interactive target marketing, marketing research, and automated order processing can be used to fast-track the process of proposal forms being filled online by customers to seal the entire contract without delay. Computerisation of every activity and easy access to a company's website which provides necessary information to salespeople and the provision of special software that helps in calculating premiums and display associated benefits has improved salespeople's performance in the insurance industry globally (Tracy, 2004).

The increasing use of the internet to sell insurance products has continued to expand as many people can easily surf the internet to get whatever information they need. With the introduction of smart phones, many people have easy internet access and companies are taking advantage of this to reach millions of individuals and organisations (Ehiorobo, 2013). The internet has also made communication easier and faster through the use of emails to inform customers about existing products and services and also for premium notices and reminders (UKessays, 2018).

Use of social media for marketing insurance products is gaining grounds all over the world and Nigerian insurance firms are also making in-roads in this regard. The fear of rejection that is usually associated with cold calling is difficult to bear especially among young salespeople (Tracy, 2004). The social media offers an easy way out to reach people who are connected on a particular platform and have a need for the products you sell or the services you render (Ehiorobo, 2013). Salespeople make extensive use of Facebook, Whatsapp, Twitter, LinkedIn, Quora and blogs to advertise and reach out to prospects. Quite often, contacts are made, deals are sealed and referrals emanate from the satisfied customers.

### 2.2.4. Artificial Intelligence

Artificial intelligence has a wide array of uses in the business world especially where such businesses rely on big data and open to digital applications. Globally, companies are investing huge amounts of dollars to improve business performance by increasing their artificial intelligence quotient (AIQ). Coleman (2018) argues that AI technologies are being deployed to generate savings and efficiencies within the insurance value chain. AI, big data, and internet of things (IoT) are creeping into every facet of human existence and business leaders are equally experiencing this transformation (Dickson, 2020). All over the world, insurance executives are focusing more investments on acquisition and deployment of AI technologies to empower agents, brokers and employees in order to enhance customer experience with automated personalized services, faster claims handling and individual risk-based underwriting processes (Accenture, 2017). AI algorithm has helped in cost savings, pushing efficiency higher, and revolutionizing customer experience. Dickson (2020) observes that advances in edge hardware, cloud computing and internet of things (IoT) has increasingly made information about objects, people and organizations much easier to obtain in the digital world with the data readily and easily processed by machine learning algorithm. Additionally, AI has the advantages of reducing human error in processing information for decision making; it is available 24 hours every day without extra cost unlike humans that negotiate for 8 hours daily jobs; it is capable of absorbing risks that could be detrimental to human health and it is quite useful for repetitive jobs (Kumar, 2019).

Lloyds (2018) opines that internet of things (IoT) will transform the entire society and that global connectivity will attain 25 billion devices to the web by 2020 and this could skyrocket to 125 billion by 2030. The report further avers that IoT will assist insurers appreciate and have a clear understanding of potential risk exposures in marine, smart homes, water, and agricultural sectors with implications for product development and risk pricing. in a similar manner, Dickson (2020) notes that the motor vehicle insurance sector could benefit from the use of sensors such as 'telematics' to collect real-time driving data from motor vehicles unlike previous practices of relying on historical data to develop policies. Machine learning algorithm can be utilised to analyse 'telematics' data to derive driving habits and other relevant information. The same data

can help to reconstruct accident scenes which will provide necessary information for claims processing. Health insurance is also an eligible candidate to benefit from AI models as they can be used to collate claims data, prior authorization, eligibility for cover, engagement data and healthcare utilisation data in order to create a holistic profile of all applicants. Fraud prevention and control is another significant benefit that can be derived from AI through its machine learning algorithm as it is capable of gleaning patterns to separate honest claims from fraudulent ones. Advances in Natural Language Processing has equally helped in ushering in a breed of chatbots that enhance customer experience and which also leads to reduced time for claims settlement. Recent developments in Convolutional Neural Networks have made remarkable improvements in image recognition and classification of data with amazing accuracy. Insurance firms can now use image recognition algorithm to automate previously manual processes in accident case processing with results available within seconds (Dickson, 2020).

The parties to every insurance contract have historically involved the insurer and the insured. These two parties have always had asymmetrical information which is quite fundamental to understanding insurance economics. On the part of the insurer, the company attempts to gather information through the use of questionnaires, observation and statistics to predict the behaviour of the insured. On the other hand, the insured would prefer to underplay the risk, capitalize on the value of the claim and influence the price for his own personal benefit. Kessler (2018) argues that this information irregularity could lead to adverse selection and moral hazard. However, recent developments in AI technology and big data collection will totally eradicate this information asymmetry and bring comprehensive and observable transparency into the insurance transaction. Deloitte (2017) notes that AI is capable of transforming the entire insurance industry such that all parties in the insurance ecosystem including brokers, underwriters, reinsurance companies, and even customers will adopt AI tools and methodologies. This will involve enhancing efficiencies in customer experiences, risk analysis, underwriting, claims handling, and new product development. Shabbir & Anwer (2015) argue that artificial intelligence will certainly transform how companies compete around the world which will ultimately drive corporate performance and profitability.

#### 2.2.5. Artificial Intelligence and the Sale of Insurance Products

Sales and distribution of insurance products has received a boost in recent years. AI is being applied to improve intelligent customer engagement in insurance companies and this is making it easier for customers to take out their desired insurance policies (Coleman, 2017). Sales of insurance policies is fast changing globally as companies are now depending less on brick-and-mortar selling techniques that have been practised for centuries (Ehiorobo, 2013). It is the ultimate wish of every salesperson, agent or broker to sell more by being able to identify the right customers with the most suitable products that can satisfy their needs. This is where AI technologies can come to the rescue (Agababa, 2018). Artificial intelligence helps salespeople in identifying quality prospects and spotting which accounts that are most likely to make a purchase. AI offers better sales insights to the ever more demanding and highly knowledgeable customers who are only interested in buying solutions to their problems. For this purpose AI is capable of providing data for predictive analytics and automated insights for lead scoring and other opportunities for understanding customer characteristics and their buying motives.

Customers who use Chatbots for instance, possess superior information about their insurance needs by using health sensor data, face mapping tools and AI genetic prediction systems. Genuit (2018) opines that AI technologies are useful in workload balancing/lead allocation for insurance agents and salespeople; machine learning insight for supporting market segmentation; computerized demand analysis and generation of new product ideas; customer personality profiles and tone analysis; automatic creation of target marketing and promotional tools, and automated product recommendations and natural language question responses. Some identifiable benefits that AI brings to sales and distribution also include lead generation, effective cross and up-selling proficiencies, and improved service delivery.

AI is available 24 hours on a daily basis and this gives customers flexible time to make their purchases (Kumar, 2019). With the deployment of voice bots customers have a ready vendor to attend to them, answer queries, and facilitate the purchase decisions by offering customers the advice and available product options. AI reduces the cost of sales attributable to field salespeople because no commissions are required when customers buy online. Artificial intelligence is also capable of eliminating the time, energy and money wasted on administrative, service requirements, meetings, training, travelling and other non-core selling activities to enable salespeople to concentrate on the actual job of selling. Virtual assistants and chatbots can arrange meetings and sales calls to lessen the workload of salespeople while process automation with predictive analytics helps to identify relationships between data. This enables salespeople to develop a deeper understanding of customer behaviour which in turn helps to forecast future sales more accurately (Latinovic & Sharmila, 2019). AI is also useful for providing data that enables salespeople to identify, analyse and understand where things are not going well with the sales process. Thus, actionable intelligence and workflow automation can help in proffering solutions that boost customer relationship management (Agababa, 2018).

### 2.3. Conceptual Model

The conceptual model depicts the relationship between information technology and the sales and distribution of insurance products. Other information technology infrastructure is adopted as the independent variable, sale and distribution is the dependent variable while artificial intelligence is adopted as a moderating variable.

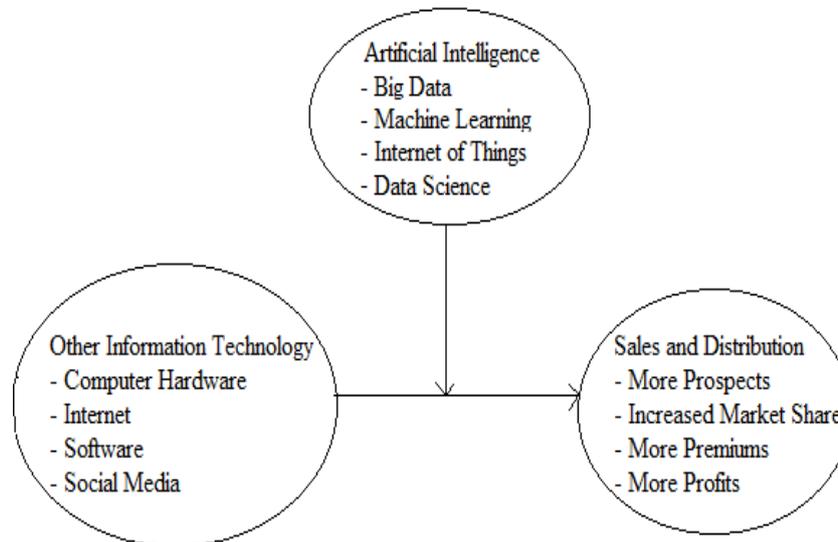


Figure 1. Conceptual Model

**Source:** Author (2020)

## 3. Methodology of the research

### 3.1. Research design

The research adopts a quantitative design based on the positivist philosophy and an ontological orientation of objectivism. The reason for the choice of this design is due to the fact that data relating to this study are empirically testable for proof and verification.

### 3.2. Sources of data, sample obtained and data collection technique

The data for this study was obtained from 15 insurance firms sampled from the 56 registered underwriting firms in Nigeria using the stratified sampling technique to obtain samples that included 4 life insurance companies, 8 non-life insurance firms and 3 composite insurance companies. A questionnaire divided into three parts with items to measure level of adoption and investment in artificial intelligence makes up the first section. The second part consists of items measuring knowledge, adoption and usage of other forms of information technology while the third part consists of items measuring sales and distribution of insurance products. A total of 250 questionnaires were administered to the senior staff of these companies out of which 235 were returned and found usable.

### 3.3. Description of variables

The variables of interest in this study are one dependent (Sale and Distribution) and one predictor variable (Information technology) while artificial intelligence was adopted as a moderating variable.

### 3.4. Data analysis technique

Data for this study was analysed using the Andrew Hayes Process Approach v3.3 for measuring interactions between variables in regression. This method adopts the grand mean centring which is a process of transforming a variable into deviations around a fixed point. It is usually very important to centre variables when trying to establish interactive effects between two or more independent variables as it makes the *bs* for lower-order effects very easy to interpret. Thus, when the Andrew Hayes Process tool is applied, centring is automatically effected with SPSS (Statistical Package for the Social Sciences). Consequently, it is easy to determine the effect of the predictor at the mean value of the sample and the average effect of the exogenous variable across the range of scores for the other predictor.

### 3.5. Model specification

The regression model for the interaction effect between the exogenous variable (Information technology) and the moderator (Artificial intelligence) is given thus:

$$Y_i = (b_0 + b_1A_i + b_2B_i + b_3AB_i) + e_i \tag{1}$$

$$\text{ie. Sales and Distribution} = (b_0 + b_1IT + b_2AI + b_3 \text{ Interaction}_i) + e_i \tag{2}$$

Where  $b_0$  = intercept,  $b_1$  = represents the relationship between sales and distribution and information technology when artificial intelligence is zero. And  $b_2$  represents the relationship between sales and distribution and artificial intelligence when information technology is zero;  $b_3$  is simply the interaction between the two predictor variables while  $e_i$  is error term.

## 4. Data analysis, findings and discussions

### 4.1. Analysis and findings

The model summary in Table 1 shows that  $R = .63$  which is an indication of a positively strong and significant relationship between artificial intelligence and the other information technology infrastructure.  $R^2$  which is the measure of the variability in the dependent variable explained by the predictors is about .40 and all significant at .0000.

Table 1. Model Summary of the Regression Analysis

Model Summary						
R	R-sq	MSE	F	df1	df2	P
.6323	.3998	.6384	51.2844	3.0000	231.0000	.0000

Source: Author's Computation (2020)

Table 2 shows the regression analysis for the independent variable (Information Technology) and the moderator (Artificial Intelligence). From the analysis, it can be deduced that  $b = .1907$ ; 95% CI [.1288, .2525];  $t = 89.6531$ ,  $p = .0000$  which is an indication that the relationship between other information technology infrastructure and sales and distribution of insurance products is moderated by artificial intelligence.

Table 2. Model Coefficients of the regression analysis

Model	coeff	se	t	p	LLCI	ULCI
Constan	4.9768	.0555	89.6531	.0000	4.8674	5.0862
Tech	.6015	.0622	9.6672	.0000	.4789	.7241
AI	.0923	.0625	1.4782	.1407	-.0307	.2154
Int_1	.1907	.0314	6.0761	.0000	.1288	.2525

Product terms key:

Int\_1: Tech x AI

Source: Author's computation (2020)

Table 3, which displays the  $R^2$  Change, shows the additional variation in the dependent variable as a result of incorporating the moderator variable.

Table 3. Test(s) of highest order unconditional interaction(s)

	R <sup>2</sup> -chng	F	df1	df2	p
X*W	.0959	36.9196	1.0000	231.0000	.0000

Focal predict: Tech (X)

Mod var: AI (W)

Source: Author's computation (2020)

From Table 4, further probe of the results of the statistically significant interaction between the predictor and moderator variables can be carried out in order to better understand the nature of the moderated relationship between AI and other information technology with simple slopes at three distinct levels of the moderator.

At -1 standard deviation (-1 sd, i.e. -8302) on the centred AI variable which is low AI, the relationship between IT and sales is positive and statistically significant ( $b = .4432$ ,  $se = .0599$ ,  $t = 7.4037$ ,  $p = .0000$ ).

Table 4. Conditional effects of the focal predictor at values of the moderator(s)

AI	Effect	se	t	p	LLCI	ULCI
-.8302	.4432	.0599	7.4037	.0000	.3252	.5611
-.0302	.5957	.0619	9.6173	.0000	.4737	.7178
.9698	.7864	.0770	10.2150	.0000	.6347	.9381

Source: Author's Computation (2020)

Also, at the mean value of AI (i.e. -.0302), the centred moderator variable representing medium AI, the relationship is positive and statistically significant as well ( $b = .5957$ ,  $se = .0619$ ,  $t = 9.6173$ ,  $p = .0000$ ). Finally, at 1 sd, i.e. (.9698) on the centred AI variable representing high AI, the relationship is also positive and equally significant with ( $b = .7864$ ,  $se = .0770$ ,  $t = 10.2150$ ,  $p = .0000$ ).

Table 5. Moderator value(s) defining Johnson-Neyman significance region(s)

Value	% below	% above
-2.3228	2.9787	97.0213

Conditional effect of focal predictor at values of the moderator:

AI	Effect	se	t	p	LLCI	ULCI
-.8302	-.1288	.1177	-1.0943	.2749	-.3608	.1031
-3.5302	-.0716	.1097	-.6529	.5144	-.287	.1445
-3.2302	-.0144	.1019	-.1415	.8876	-.2152	.1864
-2.9302	.0428	.0944	.4531	.6509	-.1432	.2288
-2.6302	.1000	.0873	1.1453	.2533	-.0720	.2720
-2.3302	.1572	.0807	1.9489	.0525	-.0017	.3161
-2.3228	.1586	.0805	1.9703	.0500	.0000	.3172
-2.0302	.2144	.0746	2.8735	.0044	.0674	.3614
-1.7302	.2716	.0693	3.9181	.0001	.1350	.4081
-1.4302	.3288	.0650	5.0611	.0000	.2008	.4568
-1.1302	.3860	.0617	6.2507	.0000	.2643	.5076
-.8302	.4432	.0599	7.4037	.0000	.3252	.5611
-.5302	.5004	.0594	8.4212	.0000	.3833	.6175
-.2302	.5576	.0605	9.2225	.0000	.4385	.6767
.0698	.6148	.0629	9.7730	.0000	.4908	.7387
.3698	.6720	.0666	10.0890	.0000	.5408	.8032
.6698	.7292	.0714	10.2179	.0000	.5886	.8698
.9698	.7864	.0770	10.2150	.0000	.6347	.9381
1.2698	.8436	.0833	10.1283	.0000	.6795	1.0077
1.5698	.9008	.0901	9.9931	.0000	.7232	1.0784
1.8698	.9580	.0974	9.8335	.0000	.7660	1.1499
2.1698	1.0152	.1050	9.6648	.0000	.8082	1.2222

Source: Author's Computation (2020)

Table 5 which is the Johnson-Neyman significance region shows that as the conditional effect of the predictor at different values of the moderator moves from negative towards positive the effect also increases progressively from negative to positive.

#### 4.2. Discussions

Based on the analysis and test of hypotheses, it can be deduced from hypothesis (Ho1) which states that other information technology plays no significant role in the sale and distribution of insurance products has a regression coefficient  $b = .60$ ,  $p = .0000$  which indicates a strong positive and statistically significant relationship. Consequently, Ho1 is rejected. Ho2 which states that artificial intelligence plays no moderating role in the relationship between other technology infrastructure and the sale and distribution of insurance products has a coefficient of  $b = .19$ ,  $p = .0000$ . This is an indication of a statistically significant moderation effect, thereby nullifying the research hypothesis. Therefore, Ho2 is also rejected. From the foregoing, it is expedient to conclude that information technology is required to boost the sale and distribution of insurance

products and when used in conjunction with artificial intelligence, the interaction effect will produce better results. This finding supports the adoption and usage of information technology and artificial intelligence which have gained centre-stage in every industry, including insurance, at the global level. The sale and distribution of insurance products can be greatly enhanced with the deployment of technology infrastructure to reach and appeal to more prospects in this digital age. However, the Nigerian insurance industry is still at the very elementary stage of adoption of these ubiquitous technologies and has not fully integrated artificial intelligence into its information technology infrastructure. The findings of this research is in consonance with the findings of other researchers such as Barbington-Ashaye (2014); Deloitte (2017); Kumar (2019) and Scor (2018) which highlight the importance and improvements that can be achieved by deploying information technology in selling insurance products.

## 5. Conclusions and recommendations

This research was undertaken to ascertain the effect of information technology on the sale and distribution of insurance products in Nigeria with artificial intelligence as a moderating variable. 235 questionnaires were completed and analysed from 15 registered insurance companies in Nigeria and findings from the study revealed that information technology is a useful tool for enhancing the sale and distribution of insurance products and that the relationship existing between information technology and sale of insurance products is moderated by artificial intelligence. The implication of this is that insurance firms wishing to improve their performance in the sale and distribution of insurance products will have to invest on information technology infrastructure and deploy artificial intelligence to leverage the relationship between other IT infrastructure and sale and distribution of insurance products.

Based on the foregoing, it is hereby recommended that Nigerian insurance companies should embrace artificial intelligence and expand their investment and usage of other information technology infrastructure.

## 6. Suggestion for Further Research

This study was domiciled in Nigeria where the knowledge and adoption of artificial intelligence is very low. Consequently, the result from the study may not be universally applicable and further research on the topic needs to be carried out in other countries, especially the developed countries, or where the knowledge and adoption of AI is much higher in order to validate or reject the findings of this study.

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