

Information and Communication Technology in Nigeria Insurance Industry: Developments, Challenges and Prospects



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ABSTRACT: Insurance industry provides insurance protection/financial guarantee to the insuring public in a given economy say Nigeria. The existence of risk allowed impetus for the insurance industry. Firms, governments and households act in ways that mitigate the adverse effects of risks on their assets, operations and social responsibilities. Insurance contracts are among the risk management choices of the persons exposed to risks. In Nigeria, the insurance industry is not too popular and needs to build trust and confidence among the insuring public. Information and Communication technology innovations that are changing the manner of doing things have potentials of facilitating, boosting trust and keeping insurance industry relevant. These can be realized via efficient insurance service delivery and innovations. This study using scooping approach aims at examining the level of information and communication technology (ICT) applications in Nigeria insurance industry, and promoting the ICTs in the industry. The study while identifying favourable demography and sustained innovations in ICT in Nigeria recommends sustained interest of the stakeholders towards adoption of ICT in Nigeria insurance industry.

KEYWORDS: Information, Communication, Technology, E-insurance, Financial technology

1. INTRODUCTION

Insurance industry is the industry that engages in insurance business, that is, the business of providing financial guarantees to the insuring public. These guarantees are required for various exposures to insurable risks by persons including individuals, firms, non-profit making organizations and government agencies. The insurance protection may be provided against fire losses, emerging risks, agricultural risks, those risks arising from or in connection to use of motor vehicle, those risks associated to marine and aviation; (as the cases of non-life insurances); and those pertaining to duration of human lives (as the case of life insurances and health insurances).

Key players in the insurance business include the insurance companies, reinsurance companies, insurance brokers, insurance agents, insurance market associations, the insurance industry regulatory/supervisory authorities and financial technology firms. As a service industry and operating in information driven environment courtesy of advances in information and communication technology (ICT), the industry's relevance depends largely on adoption of ICTs.

Information and Communication Technologies (ICTs) refer to all communication technologies, including the internet, wireless networks, phones, computers, software, middleware, video-conferencing, social networking, and different media applications and offerings enabling users to access, retrieve, store, transmit, and manipulate information in a digital form (Hoque & Alam, 2010). ICTs pervade all facets of human life with profound impact as a means of bridging the information gap and as an effective tool for economic and social development (Hofman, et.al., 2016). The concepts, methods and tools involved in ICTs are steadily evolving. The evolution is made possible by the innovativeness of individuals in different fields driven by the desire to tap into the enormous potentials of ICTs to provide practical solutions to real challenges (Loukis, et al., 2016).

The new normal of restrictive face-to-face business transaction caused by Covid-19 pandemic has intensified the quest for a reliable way of doing business without disruption. The sudden change in the way businesses are conducted makes the understanding of the utilization of ICTs in insurance sector important. Seeking an understanding of the utilization of ICTs in the insurance market of a developing economy like Nigeria is even more important for the stakeholders in the sector. In fact, Adeyele and Maiturare, (2012) observe that the Nigeria insurance industry has been underperforming.

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Scoping review is adopted in this study. It aims at providing an overview of extant research evidence in a given area without producing a summary answer to a discrete research question (Teare & Taks, 2020; Peters, et. al., 2015). Thus, this work on Information Communication Technology in Nigeria Insurance Industry: Developments, Challenges and Prospects has been arranged in sections. In addition to the introduction, other sections are conceptual reviews; empirical studies; ICT developments in insurance industry; challenges confronting the industry; prospects of the industry; and conclusion.

2. CONCEPTUAL REVIEWS

2.1 Information and information system

Okonkwo and Okechukwu (2021) assert that information means many things to many people, depending on the context. Scientifically, information is processed data. Information can also be loosely defined as that which aids decision making (Witherspoon, 2015). Information, though abstract, could also be visualized as a commodity, which could be bought or sold. Watteville and Gilbert, (2000) defines information as whatever is capable of causing a human mind to change its opinion about the current state of the real world.

An information system (IS) in a simple sense refers to any means for communicating knowledge from one person to another, such as by simple verbal communication, punched-card systems, optical coincidence systems based on coordinate indexing, and completely computerized methods of storing, searching, and retrieving of information. In a broader sense, it is a group of formal process that together collects, retrieve, process, and store as well as disseminate information for the purpose of facilitating planning, control, coordination and decision making say by individuals or in organizations.

Information system can also refer to a computerized database designed to accept, store, process, transform, make useful, and analyse data and to report results, usually on a regular, ongoing basis. Generally, there are five components of IS, namely Computer hardware, computer software, telecommunications, databases and data warehouses, and human resources and procedures (Britannica, 2021).

Information and communication technology on the other hand provides the technical solutions identified in the information system; including the networks, hardware and software (Accad, 2009).

2.2 Information and communication technology

Communication refers to the exchange of information from person to person or from one place to another. When action produce a reaction, whether positive or negative, communication has taken place. It involves the exchange of ideas, facts, opinions, attitudes and beliefs between people. It is not a one-way affair. There must be a sender to transmit the message, and receiver to make appropriate decisions on how the rest of the exchange should continue (James & Short, 2004).

Microsoft Encarta, (2009) defines information and communication technology as the processing of data via computer: the use of technologies from computing, electronics, and telecommunications to process and distribute information in digital and other forms. It consists of combining the technology of computers and communications to provide information processing services throughout the office or around the world. Sajuyigbe and Alabi, (2012) observe that ICTs encompass technologies that can process different kinds of information (audio, video, text, and data), and facilitate different forms of communications among human agents, and among information systems. It involves harnessing electronic technology for the information needs of persons say individuals and corporate entities.

Longley and Shain (1992) defines information and communication technology as the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a micro-electronic based combination for computing and telecommunication.

2.3 Financial technology

Technology refers to techniques/devices developed by human minds other than natural creation, through which something can be done in attempt to better human existence on earth.

The technologies designed to facilitate financial services delivery can be described as financial technology (FinTech). The financial technology otherwise known as FinTech are software and innovations used by persons that provide automated and improved financial services. It is integration of technology into the services of financial institutions with a view of improving service delivery and promoting consumers' experience. When, the service is on financial guarantees, it is called insurance technology or simply insurTech (i.e. those associated to insurance business are called InsurTech).

Financial technology manifests in six main forms, namely

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a. **Application program interfaces (APIs)**. These are a set of routines, protocols, and computing resources which aim to create efficient methods of communication that allows the interaction with other systems thereby enhancing easy access to information and services.

b. **Aggregators**. An aggregator is any device that provides multiple services to other devices or users either with its capabilities or by forwarding transmissions in more concentrated and efficient manner. Examples of companies using aggregators are Paypal and ApplePay and Square.

c. **Cloud computing** are models that provides on demand services such servers, storage, and applications. Depending on the ownership and operability three types of cloud computing are public (owned and operated by third provider and are available for the public; private (owned by an entity and used by the owner); and the hybrid (combination of the private and public operation of the cloud).

d. **Machine learning** are computers with the ability to learn without having to be explicitly reprogrammed through a set of self - optimizing data analysis algorithms.

e. **Big data analytics** are models that examine both structured and unstructured data with a view of optimizing operations.

d. **Distributed ledger technology (DTL)** which stores information in registries owned by every computer linked to a specific network say block chain technology such as cryptocurrencies and bitcoin.

2.4 Development

The term *development* has many facets. For this work, development infers acts that bring about growth, improved performance and quality human living. It consists of a process that creates growth, progress, positive change or the addition of physical, economic, environmental, social and demographic components in say an economy or industry.

2.5 Nigeria Insurance industry

The Nigeria insurance industry consists of insurance market, other facilitators and the regulatory authorities that have roles to play in providing insurance function to the insuring public. The insurance market includes insurance buyers (the insureds), sellers (the insurers and reinsurers) and insurance intermediaries (insurance brokers and agents) (Okonkwo, 2012).

Specifically, Nigeria insurance industry consists of insurance companies, reinsurance companies, insurance intermediaries (insurance brokers and agents), insurance support services (actuaries, loss adjusters, surveyors etc) and insurance associations. (Okonkwo, 2012).

The statute governing insurance in Nigeria is the Insurance Act 2003. In section 2 (1) (2) and (3), it classified insurance business in Nigeria as follows;

i). There be for the purpose of this Act two main classes of insurance that is:-

- a. life insurance business and
- b. General insurance business

ii). In the case life insurance, there be 3 categories

- a. Individual life insurance and business;
- b. Group life insurance and pension business; and
- c. Health insurance business.

iii). In the case of general insurance, there shall be 8 categories

- a. Fire insurance business;
- b. General accident insurance business,
- c. Motor vehicle insurance business,
- d. Marine and aviation insurance business,
- e. Oil and gas insurance business;
- f. Engineering insurance business;
- g. Bonds credit guarantee and surely ship insurance business and;
- h. Miscellaneous insurance business

3. EMPIRICAL STUDIES

Automation of the underwriting process is more efficient in the pricing of risk as it is free from human influence and possible idiosyncrasies. Automation is a store, retrieve, run and execute operation which supports the management of a firm's cash flows (Braunwarth, Kaiser & Müller, 2010). A cost-cutting example of automation in the insurance industry is the automation of pay-out calculation at a Japanese insurance company, Fukoku Mutual Life Insurance, which involved the replacement of 34 employees by

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AI (The Guardian, 2017). The Guardian (2017) reported that Fukoku Mutual Life Insurance experienced a 30 % boost in the company's productivity and saved an estimated \$1.25 million at the end of the first year of full automation using AI.

Yadav and Mohania, (2013) reported that the delay in claims settlement can have a negative effect on the reputation of the insurance industry as a customer may perceive it as an insensitivity or liability abandoning tactics by an insurer.

Automating the claims management process with AI is the effective means of handling claims reports in a timely manner while cutting cost (Braunwarth, Kaiser & Müller, 2010). In the event of risk in nature with catastrophic propensity, loss data can be gathered through the use of drones and satellite images of the affected area and AI applied in processing the data to determine the detrimental value (Nicholson, 2019; Mohammad, 2020; Chakravaram, Jangirala&Ratnakaram, 2020). The application of AI in claims management supports efficient loss assessment and significantly cut time and cost with a knock on of timely claims settlements and public confident in the insurance industry (Chakravaram, *et al*, 2020).

A 2015 report by the GSMA stated that about 120 insurance services were provided through the mobile insurance industry in 33 developing countries. A significant proportion, 58%, of these mobile insurance products were sold and bought in sub-Sahara, 19% in south Asia while East Asia and the Pacific accounted for 18%. Furthermore, the report indicates a 68% increase to a total of 31 million mobile insurance policies issued between 2014 and 2015. According to the report, with 51% of services offered through mobile insurance, the life insurance dominated the products offering of the mobile insurance market in the period reported. The report equally showed a diversification in the classes of insurance offered through the mobile phone with 22% of health insurance, 13% of accident insurance, 7% of agriculture insurance and other classes constituting another 7%. According to the report, 84% of customers subscribed to mobile insurance services directly from their mobile phone while 16% of the subscription was through a third party device such as an agent. Predominantly the method for paying insurance premiums as revealed by the report was through airtime deduction (63%), as 48% of customers paid their premiums via mobile money. As stated in the report, 48% of services used mobile money for pay- out in 2015 (Ampaw, et al., 2019).

Empirical evidence reveals a significant positive relationship between mobile phone penetration and financial inclusion as investment in mobile technology is considered a necessity (Kpodar & Andrianaivo, 2011; Wayne, et al., 2020).

4. ICT DEVELOPMENTS IN INSURANCE INDUSTRY

Nigerian insurance industry is being repositioned to take up its expected leading role in Africa. The rising population and market capacity of Nigeria are plus on her role in transforming other African economies (Okonkwo and Okeke, 2020). From 2010, the industry through the National Insurance Commission has conceived framework and guidelines of transformation and growing the industry especially on aspects of micro-insurance, Takaful, and Oil and gas insurance businesses. ICTs are potential tools of realizing the growth of the insurance industry.

The application of ICTs in the insurance sector holds enormous benefits to firms and the economies around the world including Nigeria. E-insurance, that is the application of ICTs in the production, distribution and management of insurance services, is gaining prominence in practice. The rapid traction gained by E-insurance is informed by the reality that the design, marketing, payment, policy delivery and claims processing can all be done with the use of ICTs without the parties involved in the business meeting face to face (Taylor, Celuch& Goodwin, 2002). Among the areas the ICTs are evident in insurance industry developments include:

4.1 Internal Workflow Automation:

Routine task, such as written reports, notifications, follow-ups and manual underwriting, are boring, slows down productivity and limits the innovativeness of employees (Østergaard, Timmermans & Kristinsson, 2011). The advent of ICTs has made the automation of routine and repetitive workflows possible (Whong&Zakari, 2014). Automation permits businesses to reduce the cost of routine work and refocus employees to innovative tasks (Abbott & Bogenschneider, 2018). Automation is typically driven by an Artificial Intelligent (AI) or a Robotic Process Automation (RPA) system (Beerbaum, 2019). The automated system enhances the capacity to conduct such administrative routines as writing of reports, issuance of notifications and follow-up memos.

4.2 Claims management software:

ICTs are redefining the traditional way of claims management. They are restructuring claims management with innovations that support effectiveness (Braunwarth, Kaiser & Müller, 2010). Claims management is a critical part of any insurance business and it begins with the registration of the prospective claims by the insured and ends with the compensation decision by the insurer. From the client's perspective, claims management is expected to consume less time and claims handling should follow a smooth process (Mahlow& Wagner, 2016). The insurers on their part strive to reduce claims handling cost (Baecker& Bereuter, 2010). However, reaching claims decisions typically take a long time and are fundamentally influenced by human factors (Baecker& Bereuter, 2010). The delay in reaching claims decision may be caused by the complexity in the occurrence of the risk insured or

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the scope of the cover, for example a drought hitting hectares of insured farmland (Baecker& Bereuter, 2010). Ideally, when the scope of a prospective claim is wide, reaching a pay-out decision will take employees a long time to gather all the relevant data and process same. In addition, the assessment process may involve exorbitant cost.

Claims management software which guarantees reduction in manual workflow and a number of human-to-human interactions can also be used in processing claims (Bapat&Bapat, 2010). The software are integrated into the policy management system of the insurance company so that the company can use it to manage reconciliations, customize business logic and manage policy rights. There are claims management software by SAP, Oracle, Patra Corp, GuideWire, Claim Kit, and Insly that fulfil standardized needs in claim and policy management for the insurance industry that insurers can acquire for use (TheActuary.Net, 2018).

4.3 Innovation in Motor Vehicle Insurance:

One of the portfolios of risk that the insurance industry is well concerned with its proper management is the motor vehicle risk portfolio. This is so because the portfolio is highly exposed to moral hazard (Dionne, Michaud &Dahchour, 2013; Weisburd, 2015). Insurers are faced with emerging risk from motor vehicle insurance as a result of advancement in technology through the launch of autonomous vehicles (Taeihagh& Lim, 2019).

ICTs is revolutionizing the way insurance companies should handle motor vehicle risks portfolio with telematics insurance. Telematics insurance is the name given to innovative motor vehicle insurance products that can be installed directly into a vehicle (Handel, Skog, Wahlstrom, Bonawiede, Welch, Ohlsson, &Ohlsson, 2014). The functioning components in a telematics box are Global Positioning Systems (GPS) motion sensors, SIM cards backed up by analytics software (Ayuso, Guillen &Marín, 2016; Wahlström, Skog &Händel, 2017). Practically, a telematics box tracks driving information such as speed, location, time, crash accidents, driving distances, breaks, and others as may be deemed necessary by an insurer (Husnjak, Peraković, Forenbacher&Mumdziev, 2015; Wahlström, *et al.*, 2017). The system processes gathered driving data and transmits same through the mobile Internet to the insurer for further analysis (Ayuso, *et al.*, 2016). The driving analytics are then added to a customer personal account.

The tracking of drivers' behaviour with telematics enables the insurance company to create bespoke insurance plans and improve risk management (Guillen, Nielsen, Ayuso, & Pérez-Marín, 2019). The tracking app basically gather data for the insurer, and allows the insured to access the tracked and stored driving information after each journey. Also, the app offers tips to the insured on improving their driving to mitigate risk.

Telematics makes it possible for safe-drivers to be rewarded, irresponsible drivers can be punished with increase charges and the police can be notified almost on real-time if an accident occurs (Bian, Yang, Zhao & Liang, 2018). Usage-based-insurance (UBI), pay-as-you-drive (PAYD) and pay-how-you-drive (PHYD) are innovative products in the motor vehicle insurance line that are supported by telematics (Desyllas&Sako, 2013; Arumugam&Bhargavi, 2019).

4.4 Mobile Insurance:

Mobile insurance also known as m-insurance is insurance whose sale, administration and payment is facilitated by a mobile phone (Leach &Ncube, 2014). Thus, mobile insurance depends on the mobile phone ecosystem and infrastructure to support the functions of the insurance process. There are three leading m-insurance models on the market, differentiated by their model of payment. The first is the loyalty based model (paid for by the firm offering its customers m-insurance as an incentive to drive patronage of its original product. The second is the mobile wallet payments model (paid for by the insured with mobile money). And, the third is the airtime deduction model (paid for by the insured with airtime) (Ampaw, Chai&Frempong, 2019; Obadha, Colbourn& Seal, 2020). All m-insurance models use licensed underwriters in addition to mobile network operators (Ampaw,*et al.*, 2019). In Nigeria, a mobile network operator, MTN, launched Y'ello Cover in 2013, which used airtime deduction model and reportedly reached 1 million policyholders. The daily and weekly premiums for Y'ello Cover were 15 Naira and 100 Naira respectively with a benefit plan of 350,000 Naira maximum to cover medical expenses and permanent disability. Y'ello Cover appeared to be the most successful paid m-insurance product globally.

4.5 Index based insurance product in agriculture:

ICTs have enabled product innovations in agriculture insurance with index based insurance. The leading product in this regards is the weather indexed insurance whose functionality requires intensive time series data on weather and associated losses for farmers (Maher & McCaffrey, 2018; Woerd, 2018). ICT supports the gathering of quality weather data based on satellite information. This information obtained from high-resolution satellite imagery makes data available to facilitate the design of weather indexed insurance products that was impossible to develop due to lack of data (Woerd, 2018). Also, localized weather station connected to a smart phone through an application can be used in gathering local weather data which enhances the

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development and sustainability of weather-indexed insurance (World Bank, 2011). This indicates that ICTs have reduced constraints that were associated with lack of data and high administrative cost. Assessment of loss is carried out through the use of remote sensing technology and wireless point of sale system is deployed in the distribution of the product (Hazell, Anderson, Balzer, Hastrup, Clemmensen, Hess & Rispoli, 2010). The main aim of weather index insurance is to interrupt the downward spiral of farmers' vulnerability to poverty that is exacerbated by climate change (Tadesse, et al., 2015).

4.6 Peer-to-Peer Insurance:

With support from the ICTs, a product called peer-to-peer insurance has been developed and it is rapidly gaining popularity. Peer-to-Peer (P2P) insurance model is an arrangement where network of individuals that are exposed to a similar risk create a single pool consisting of their premium shares (Denuit, 2020). P2P insurance does not require a traditional intermediary such as an insurance company (Clemente & Marano, 2020). A typical P2P insurance is offered on an annual basis and managed online (Njatrijani & Prananda, 2020). This product is popular among individuals that are exposed to non-life risk even though it can be adapted to life insurance (Rego & Carvalho, 2020). Insurance distribution, insurance carrier and self-government are the milestones that Peer-to-peer insurance has already passed (Clemente & Marano, 2020). The distribution of P2P insurance involves the use of a mobile app to connect insureds. (Davis, 2018; Clemente & Marano, 2020). A group of individuals that are exposed to a similar risk and pool their premium shares to cover the risk are called insureds.

If an insured event occurs, an insured reports a claim online via the app and gets indemnified. Online risk-sharing platform that focuses on grouping insureds by their risk similarities also exist as insurance carriers for P2P insurance. These carriers use actuarial software in the underwriting process and provide appropriate quotation to different groups. In addition the insurance technology carriers provide the P2P groups an online platform where claims are assessed and approved. The success of the P2P insurance is supported by the existence of online insurance platforms that are offering self-governing services which allows for transparency and self-regulation in a P2P insurance group. Insureds discuss each claim that arises and vote to arrive at a consensus on claim coverage. On approval of the claim, each participant shares a proportion of their premium with a peer that suffered the loss. At expiration of the contract, customers are paid pre-agreed cash backs from funds available in the pool (Clemente & Marano, 2020). This way, costs of insuring a risk and claim conflicts amongst insureds are minimized.

4.7 Virtual Agent and Broker:

Insurance agents and brokers invest huge number of manpower hours providing standard on-demand information or report to support customers in the decision making process (Maas, 2010). This tedious task can be executed through a virtual system known as the chatbots. Chatbots function on voice recognition algorithm and can effectively function as a large customer care centre cutting cost in customer support and sales (Zumstein & Hundertmark, 2017). Aside from the guarantee of a round the clock online availability of an insurer to engage with customers, chatbots attends to new clients, deals with preliminary issues in claims report and handles service requests (Følstad & Skjuve, 2019). The service delivery toolbox of chatbots contains notification to customers on policy renewal, assignment of task to employees, building warm relationships with clients by sending messages of felicitations and company's special offers (Riikkinen, Saarijärvi, Sarlin & Lähteenmäki, 2018). Chatbot is a good alternative to phone calls in customer care (Srivastava & Kaur, 2015).

4.8 Fraud detection:

Fraudulent claims have placed enormous cost on the insurance industry and huge burden on the society (Verma, Taneja & Arora, 2017). The industry's continuous fight against fraudulent claims has given rise to innovations in fraud detection in the claims process. Insurance technology experts are reinventing gadgets and software with the potential to eliminate fraud in the industry. An insurance fraud detection software offered by Shift Technology, demonstrates 250 percent better fraud identification rate than the market average (Shift Technology, 2021). The Cloud and mobile technologies both have the capacity to support insurance carriers with information on real-time basis to detect claims fraud that are duplicated, claims that are inflated, diagnoses that are fake or mutually exclusive, fake dependent family members, insurers data inconsistency, overpayments, and internal employee scams by comparing a claim data with the central claims database (Verma, et al., 2017). This system increases operational speed, delivers higher accuracy and eliminates the interference by an interested party (Ngai, Hu, Wong, Chen & Sun, 2011). In addition, the fraud detection system provides insurance carriers actionable analytics that is useful in establishing reasons for tagging a claim as suspicious (Rawte & Anuradha, 2015). More so the cost of implementing the system is low and it can be easily connected to existing operational protocol of a user (Ngai, et al., 2011).

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4.9 Internet of Things (IoT):

IoT devices, from wearables like FitBit (a company specializing in fitness tracking apps and wearables) to vehicle telematics devices (vehicle systems that facilitate and enhance navigation, safety and communication features), have quickly become a regular part of many people's daily routines. IoT has one of the clearest and most impactful roles to play in insurance for years ahead. Insurers are leveraging IoT devices to harvest data, reduce risk, customize communication with customers, and improve customers' overall experience (Okonkwo and Okechukwu, 2021).

4.10 Globalization of the insurance marketplace:

Buying insurance covers has been made easy via ICTs. The internet has made it possible for individuals to be more aware of offerings in the insurance market (Majtánová&Brokešová, 2012). Prospective clients can easily compare products, review customer's feedbacks, or find plans that match their personal requirements by browsing the web with mobile technologies (Chrissanthis, 2016). The system grants intending clients the opportunity to be more specific in the survey of insurance product (Rokas, 2016). Nevertheless compliance with the demands of online product surveyors guarantees a better online visibility of the service providers (Majtánová&Brokešová, 2012). These online insurance marketplaces help insurance carriers cut distribution cost and simultaneously launch out more well-targeted leads (Majtánová&Brokešová, 2012; Chrissanthis, 2016).

There are a number of start-ups in Nigerian Insurance sector despite the low adoption of InsurTech. Among them are:

- (a) AutoGenius developed by Kola Oyeneyin which allows users buy auto insurance online.
- (b) CompareIN launched in 2015 allows users compare and buy an insurance policy online.
- (c) Cassava, an insurtech company allows insurance buyer to make small weekly and monthly insurance subscription payments via debit card or USSD (Unstructured Supplementary Service Data) or through their mobile airtime.
- (d) CompareGuru is a comparison website which allows users get quotes for healthcare, life, travel and fire insurance.
- (e) Carrot technologies Limited has come up with "Carrot" which is a one stop online platform that provides estate planning solutions for subscribers to securely create, update and schedule the execution of their wills and other testamentary instruments including Deed of Gifts in real time.
- (f) Airtel insurance is a product that provide Airtel subscribers Short Messages (SMSs) about the insurance cover which provides life insurance and hospital cash.
- (g) MTN Y'ello Cover package, in partnership with Mansard Insurance Plc is designed to make life insurance affordable and accessible to average Nigerian especially those in MTN network.
- (h) Y'ello Health Cover provides universal health cover to subscribers on the MTN network through accredited partner: Health Maintenance Organisations (HMOs).
- (i) National Mobile Health Insurance Product also provides universal health cover to subscribers on the Globacom network through accredited partner: Health Maintenance Organisations (HMOs). This has been developed in partnership with the National Insurance Scheme to provide health insurance to Nigerians through their handsets (Okonkwo and Okechukwu, 2021).

5. ICTS IN THE INSURANCE INDUSTRY: CHALLENGES OF ADOPTION

There are a number of challenges retarding seamless adoption of ICTs in insurance industry. Some of the challenging issues are:

5.1 Security challenge:

Adoption of ICTs in the Insurance industry exposes Insurance companies and their customers to security threats. These threats include but are not limited to virus infection through the internet, information leaks, system fault, hacking, masquerading or spoofing, capacity problems of servers and intentional or unintentional alteration of information (Sapa, Phunde&Godbole, 2014). Customers of insurance companies may be exposed to theft of credit card information, personal data disclosure, fraud and technical fault, quote accuracy and heavy data entry (Khidzir, et al., 2010).

5.2 Financial challenge:

The adoption of ICTs in the operations of firms is an investment that requires a substantial amount of money considering the technology and the technicalities that is involved. The implementation costs coupled with the uncertainty trailing the return on such investment constitute a challenge to the adoption of the new technologies by firms (Apulu, Latham & Moreton, 2011). Thus, insurance companies may consider investment in ICTs adoptions such as hardware, software, connections, maintenance and training non-attractive (Fadun, 2013). Furthermore some companies in the insurance sector lack the capacity to finance such investment (Nwala, et a., 2020).

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5.3 Technical challenge:

The insurance company and the customers face technical challenges and this may hinder ICTs adoption by an insurance carrier. The technical challenges include the complex nature of the new technologies which require new skills, limited IT skills in the company, improper networking technology in the company, dependence on external consultants which may be expensive, the rather short life cycle of the key technical software and hardware, broad band connections fluctuations, poor internet access and low internet use (Apulu, *et al.*, 2011; Ladokun, *et al.*, 2013).

5.4 Regulatory and legal challenge:

Extant regulation and legal provisions guiding the business of insurance, still remains wanting in the support of the total adoption of ICTs in the processes and operations of insurance business (Obutte, 2014). This challenge is posed by non-existent of standards for the application of ICTs in insurance business, uncertainty of legal issues surrounding ICT adoption, complexity of government regulations, differences in regulatory and legal environment among countries, discrepancy over the legality of electronic signature (Chichernea, 2010; Obutte, 2014; Nicholson, 2019).

5.5 Cultural challenge:

Organizational culture defines the values, expectations, and practices that guide and inform the actions of members of an organization. This presupposes that the adoption of ICTs by an insurance company should have a significant influence on the culture of the organization (Blissinga&McIntyre, 2017). The adjustment in the culture of an organization to accommodate a seamless integration of the new technologies into the processes and practices of the business may face both technical and manpower challenges. Technically, the adoption decision is challenged by differentiation due to issues of externality (Lawrence &Oivo, 2012). During implementation, compatibility is the key challenge, and the assimilation process will be challenged culturally by embeddedness. In addition, the new technology adoption will face stiff challenge from the employees due to fear of losing their jobs. The fear of facing redundancy expressed by employees is genuine as the adoption of ICTs will result in some of the roles that were performed by employees being taken over by the new technologies (Njoh, 2018). This may leads to duplication of work and subsequently loss of job by employees because an employer will ordinarily put a premium on the integrity and efficiency of the new technology compared to that of humans (Odoyo & Nyangosi, 2011).

6. ICTS IN THE INSURANCE INDUSTRY: PROSPECTS FOR ADOPTION

Despite the challenges of adoption of ICTs in insurance industry, there strength factors that are capable of optimizing the benefits of ICTs. Some of the prospects are:

6.1 Favourable demography:

Nigeria is the most populous African country with an estimated 202 million inhabitants in 2020 (The World Bank, 2021). The most significant demographic change to emerge in recent times in Nigeria is a growing middle income class which comprises 23% of the country's total population in 2020 (Persianas Group, 2021). The rapid growth in the middle income class coupled with improvements in education with its knock-on effect on the literacy levels are likely to drive demands for insurance offerings as the products become more affordable and better understood. Consequently, adoption of ICTs in the insurance industry remains a viable means to increase the supply of insurance products to prospective customers bridging time and distance.

6.2 Increase internet penetration level:

Over the years, there is a steady increase in the number of people with access to cell phones and internet service and the figure is even more in the rural areas in Nigeria. With over 70% of Nigerians having access to mobile phones, Nigeria remains the largest mobile telephone and internet market in Africa (Onyeajuwa, 2017). A significant number of people in Nigeria have access to social media platforms including mobile messaging systems and voice call facilities which are known to have significant impact on the development and distribution of insurance products (Sapa, *et al.*, 2014). The high penetration of mobile technology in Nigeria favourably disposes the insurance industry to myriad of innovations in the ICT world with huge prospects for a sustainable market expansion. This market expansion can be achieved by reaching the vast uninsured segment of the population to increase insurance penetration in the country.

6.3 Availability of manpower:

People are the most important assets in any business and as such, insurance companies should bring on board skilled manpower that will plan, execute and maintain the hardware and software components of ICTs adopted in the industry (Apulu, *et al.*, 2011). Even though it can be argued that the development of skilled manpower in the area of ICTs in Nigeria is still at the nascent stage, there is no doubt that thousands of ICTs graduates from tertiary institutions within and outside the country join the Nigerian

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labour market every year. These ICTs graduates include but are not limited to computer scientist, software engineers and computer engineers. As availability of skilled manpower is crucial to a successful adoption of ICTs in the insurance industry insurance service providers can recruit the ICTs graduates who are readily available in the labour market and up-skill them through specialized trainings to increase capacity and maximize output (Oghogho, 2013).

6.4 Nigeria Government policy on financial inclusion:

The Central Bank of Nigeria (CBN) adopted the National Financial inclusion strategy in 2012. The strategy was built on four strategic areas of agency banking, mobile banking/mobile payments, linkage models and client empowerment. The strategy defined a set of targets for products, channels and enablers of financial inclusion, including access, usage, affordability, appropriateness, financial literacy, consumer protection and gender. Financial inclusion is achieved when adults have easy access to broad range of financial products designed according to their needs and provided at affordable cost. The strategy was revised in 2018 to address challenges observed in the implementation (CBN, 2019; Kpodar & Andrianaivo, 2011). The targets set infer concerted efforts to promote financial inclusion. In Nigeria, financial inclusion is achieved when adult Nigerians have access to a broad range of formal financial services that meet their needs at affordable costs. The services include, but not limited to, payments, savings, loans, insurance, pension products and capital market products (CBN, 2019). There is a strong relation between insurance penetration and financial inclusion (Ambarkhane, et al., 2016).

Meanwhile in 2007 the Nigerian government had set a target of making the country's insurance market one of the top twenty largest markets in the world by 2020 (CBN, 2010). Achieving this goal meant the insurance industry wholly embracing financial inclusion and developing the technical capacities to meet the emerging challenges of financial inclusion driven by micro-insurance (Mohammed & Mukhtar, 2012). Hence, more dynamic strategies to deepen insurance reach amongst the vast populace in the country are required and the deployment of ICTs in the insurance industry is one of the useful means to achieving the goal. It therefore means that the deployment of insurance services via mobile technology platforms can potentially deepen insurance penetration rate while driving up premium income in the insurance industry.

6.5 Access to global insurance market:

The adoption of the ICTs in insurance industry eases participation and access to global insurance market. In fact, innovations in ICTs have led to the creation of a global insurance market place as insurance can easily be bought and sold without time and location as barriers.

7. CONCLUSION

ICTs have revolutionized business processes and products with enormous benefits. The focus of this study was to identify ICTs supported developments in insurance industry, the challenges to their deployments and the prospects to their applications in Nigeria. Automation of internal workflow and claims management, fraud detection, virtual agent and brokers are some of the developments, with the potential to enhance the effectiveness of the traditional model of insurance business. A cluster of ICT technologies aimed at increasing the volume of policies while reducing the rate of moral hazards in the motor vehicle insurance business called "telematics" was also identified. An ICT innovation which disrupts the contemporary insurance model by bypassing the role of an insurance company in insurance business called peer-to-peer insurance was equally identified.

We show that stakeholders in the insurance sector face challenges in the deployment and use of these technologies. These challenges arise from security concerns, lean financial resources, and scarcity of specialized technical manpower. Others were cultural resistance, regulatory and legal barriers.

The study noted favourable demography, increased internet penetration level, availability of manpower and government policy on financial inclusion as factors that may drive the adoption and use of ICTs in the Nigerian insurance industry.

Therefore, for maximum benefits from ICTs, the government the regulators and other stakeholders in the insurance sector must synergize to eliminate the challenges identified in the study as these will encourage investment in ICTs thereby ensuring the effectiveness of the insurance sector in Nigeria providing sustainably financial guarantees to the insuring public. Undoubtedly, this will bring about the emergence of a strong insurance sector which will contribute meaningfully to economic growth of Nigeria.

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