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Abstract

Purpose: The study examined the insurance opportunities and challenges in an Artificial Intelligence society.

Methodology: This study relied on a critical review of previous academic studies on Artificial Intelligence and the insurance industry between 2017 and 2022. This method was chosen since it is more reliable, economical, and efficient in terms of time and resources. In addition, the researcher opted to use recent studies since they provide more updated information on the AI technologies that have significant impact on the insurance industry.

Findings: The results of the study revealed that the reviewed studies consisted of contextual and conceptual gaps. This is because some of the studies did not target insurance companies but other companies hence the findings may not be applicable to the insurance industry. In addition, most of these studies discussed the insurance opportunities and benefits at in depth, but failed to discuss on the challenges that insurance firms face in an artificial intelligence society.

Unique Contribution to Theory, Practice and Policy: The findings of this study will be relevant to the main players in the insurance industry. The management team of the insurance companies will have a better understanding of how the various AI technologies are adopted to the different insurance operations so as to improve business efficiency. The study has also been able to outline the main challenge that the insurance sector experience in the adoption of AI, this will encourage the management to consider investing in training programmes so as to improve the skills of their employees. On the other hand, the policymakers will also benefit from this study when developing better legal frameworks that promote the adoption of AI. Further, the study will also be useful academically to researchers and scholars by expanding the body of information on insurance and artificial intelligence, which is still scarce. The reviewed studies' highlighted research gaps that can also inspire researchers and scholars to conduct additional research on artificial intelligence and insurance. In particular, the study's key research gap on the insurance challenge experienced in an artificial intelligence society.

Keywords: *Insurance Opportunities, Challenges, Artificial Intelligence Society.*

INTRODUCTION

Artificial intelligence refers to machines especially computer systems that respond to stimulus in a manner that is similar to conventional responses from humans, in thoughts, judgment, and motivation (Dick, 2019). These computer systems have enabled people to carryout numerous tasks and significantly improving their efficiency and effectiveness. They are also oftenly used to make decisions that require a high level of human expertise and this helps people to anticipate problems or deal with issues as they come up (Geetha & Bhanu, 2018). Artificial intelligence has developed and become increasingly popular in the recent past as a result of the recent developments in machine learning and deep learning algorithms (Abrardi, Cambini & Rondi, 2019). In addition, access to huge data and the fast-growing computing capacity of modern information technology systems, has hasten the creation and improved the accuracy of artificial intelligence applications (Baum, 2020).

Artificial intelligence algorithms are created to make decisions, often using current data. They differ from passive machines, which can only make mechanical or preset decisions. They combine data from numerous sources, instantaneously assess the information using sensors, digital data, or remote inputs, and then take action based on the conclusions they draw from the data (Dick, 2019). Moreover, they are capable of making decisions with a high degree of accuracy due to the significant advancements in storage systems, computing speeds, and analytical approaches (Baum, 2020). On the other hand, machine learning analyzes data that can be in the form of digital information, satellite images, visual information or unstructured data so as to find underlying patterns and provide any relevant information that can be used by software developers to investigate particular problems (Butow & Hoque, 2020).

The global adoption of artificial intelligence across various industries has transformed the modern economies and societies. The main industries that are benefiting from artificial intelligence applications include; finance, national security and criminal justice, healthcare, transportation and smart cities (Turkina, 2018). According to Abduljabbar, Dia, Liyanage and Bagloee (2019), Uber has become one of the largest companies in the transportation sector through the use of computer softwares to connect people to riders and taxis. It makes use of powerful machine learning algorithms to forecast when individuals in particular locations are likely to require rides, which assists in proactively placing drivers on the road before they are required. On the other hand, Google has grown to be one of the major players in a variety of online services by employing machine learning to analyze user behavior and then enhance its services (Kietzmann & Pitt, 2020).

Further, Lu (2019) noted that the adoption of AI increased significantly especially in the use of digital payments, AI bots and biometric fraud detection systems in the financial institutions. In US, the banking industry increased the amount of money invested in financial AI reaching to $12.2 billion between 2013 and 2014. This enabled the industry to use the softwares of AI that consider a variety of finely parsed data to carry out a thorough background check and make well-informed decisions on borrower's credit score (Setiawan et al., 2021). Additionally, other set of technologies in AI such as robotics have helped the stockbrokers and financial advisers to create personalized investment portfolios that are automated and data can easily be extracted so as to make fast decisions based on analytical factors and take the emotional aspect out of the process. As a result, this has helped the industry to reduce the risks and loses that come from unpaid loans and the

efficiency of the banking systems have increased the confidence and loyalty of customers to invest in banks (Belanche, Casaló & Flavián, 2019).

The recent technological developments in AI has opened new avenues for insurers and underwriters to efficiently use customer data available in their databases. For instance, the use of automated chatbots has enabled insurers to quickly access data from customers and customers can make any inquiries through a conversation-like interface (Riikkinen, Saarijärvi, Sarlin & Lähteenmäki, 2018). Chatbots are a new type of interaction that has helped employees in insurance sector to provide a more proactive and personalized customer experience (Sidaoui, Jaakkola & Burton, 2020). According to a survey by Statista (2019), 43% of customers felt that purchasing insurance policies using chatbots was more convenient than physically visiting the insurance offices, while 44% of the customers preferred submitting their insurance claims using chatbots.

In addition, Hentzen et al (2021) noted that intelligent chatbots also make use of Natural Language Processing (NPL) which is able to provide feedback to customers at any time and resolve 80% of customer issues without the need for human assistance. Other essential services that AI bots can provide include; keeping customers informed about the status of their claims, premium payment deadlines, policy renewals and any new offers or updates. As a result, insurance companies that invest in use of AI bots can serve more customers in a day, deliver better customer satisfaction and improve employees productivity (Sidaoui, Jaakkola & Burton, 2020).

Further, the technological advancement in machine learning algorithms has provided better research platforms, where underwriters can use to better analyze different risks and make decisions on premium pricing (Boodhun & Jayabalan, 2018). As a result, Rawat et al (2021) noted that increased accuracy in risk assessment will lead to appropriate premium pricing and efficiently vary the different insurance products. On the other hand, the use of cognitive machine learning algorithms has also increased the accuracy rate in detection of fraudulent claims which has been a major concern in the insurance sector. It is able to provide information about questionable claims, including estimates of potential liability and repair costs, and make recommendations for resolution and improvement of fraud prevention methods (Malali & Gopalakrishnan, 2020).

Statement of the Problem

The application of different sets of technologies in AI has brought about revolutionary benefits that have transformed the insurance industry. The insurance industry is now more than ever inclining towards digitization and reducing manual dependencies so as to meet their customer needs and increase their competitive advantage against their competitors. Insurers have managed to automate most of the back-office operations so as to reduce human errors in the repetitive tasks, improve their customer experience and employee productivity. However, even with the increased investment in AI technologies, most of the insurance firms today encounter many challenges before they actually benefit from AI. Maximum benefits from AI requires well-organized structures, dedicated time, teamwork, patience, consistent training and guided leadership from industrial experts (Eling, Nuessle & Staubli, 2022).

In addition, skills and talent in the field of AI has also been a main barrier in the adoption of AI technologies in the insurance sector. For instance, a survey by InsurTech (2019) noted that most of the data analysts in the insurance sector lack the skills to effectively label and interpret data generated by the AI datasets. As a result, insurance firms continue to experience business

inefficiency due to their employees' incompetence. Moreover, there has also been a major concern raised on the need to identifying the set of technologies in AI that can best suits the operation of insurance firms. This is quite important since it will enhance cost-saving when implementing AI technologies and improve business efficiency (Lamberton, Brigo & Hoy, 2017).

Studies on insurance opportunities and challenges in an artificial intelligence society are scarce. Some of the studies that may guide this discussion include; Eling, Nuessle and Staubli (2022) study on the impact of artificial intelligence along the insurance value chain and on the insurability of risks, Mikhaylov, Esteve and Campion (2018) study on the opportunities and challenges of cross-sector collaboration in AI among public sectors and Lamberton, Brigo and Hoy (2017) study on impact of Robotics, RPA and AI on the insurance industry. However, the findings from these studies were more inclined to resultant outcome of adoption of artificial intelligence and failed to clearly discuss the opportunities that insurance companies can benefit from and the challenges that arise in an artificial intelligence society. Therefore, the purpose of this study is to assess the insurance opportunities and challenges in an artificial intelligence society.

Theoretical Review

Theory of Reasoned Action (TRA)

This theory was developed by Martin Fishbein and Icek Ajzen in 1967 (LaCaille, 2020). This theory was postulated to try and explain the relationship between attitudes and behaviours of human beings towards an activity or task. It outlines that intention also referred to as behavioral intention, is the primary predictor of whether or not a person will really engage in an activity (Yzer, 2017). The behavioral intention of an individual is then influenced by his or her attitudes and the social norms within a society (Ng, 2020). According to Hagger (2019), there is a definite relationship between attitudes and outcomes. Therefore, if one thinks that engaging in a particular activity will result in a desirable or good outcome, they are more likely to have a positive attitude towards that behavior. In contrast, if one thinks that a particular behavior will result in an unfavorable outcome, they are more likely to have a negative attitude toward the behavior. As a result, a person's decision to engage in a certain action is dependent on the results they anticipate will arise from doing the behavior.

On the other hand, Tuck and Riley (2017) indicated that Ajzen defines subjective norms as the perceived social influence from the relevant groups such as family members, friends, peers, workmates etc to perform or not to perform a particular behaviour. Thus, the theory assumes that a person is more likely to carry out a behavior if relevant groups are more likely to approve of it and similarly a person is less likely to carry out an activity if the relevant groups does not approve of it (Hagger, Polet & Lintunen, 2018). This theory has been used by different researchers to explain some of the factors that influence the adoption of ICT in institutions and among individuals. The results of most of these studies that subjective norm had a more significant influence on ICT adoption than attitude. This is because, it not only influenced the behavioral intention but also satisfaction and perceived usefulness (Karnowski, Leonhard & Kümpel, 2018). In the context of our current study on artificial intelligence society, this theory will be relevant as we discuss the insurance opportunities and challenges. The available opportunities and challenges experienced in the artificial intelligence society will act as the key determinants that influence the rate of adoption of AI by insurance companies.

LITERATURE REVIEW

A study by Eling, Nuessle and Staubli (2022) analysed the impact of Artificial Intelligence on the insurance sector. The study was based on secondary data obtained from 91 articles on artificial intelligence in the insurance industry in different countries. The study also used the Porter's (1985) value chain and Berliner's (1982) insurability criteria to analyse the data collected. The findings of the study revealed that cost savings and additional sources of revenues can be achieved when the insurance industry transitions from loss compensation to loss prediction and prevention. The results also found that insurance companies may be able to anticipate loss probability more accurately by using artificial intelligence, since it provides solutions to the fundamental problems. Additionally, artificial intelligence may radically change the risk landscape by making some risks that were previously low-severity/high-frequency to high-severity/low-frequency.

A study by Eckert and Osterrieder (2020) examines the impact of digitalization on the insurance industry. The study was used secondary data obtained from 102 articles and industry studies from different researchers and academic practitioners. The findings from the analysis of the articles indicated that the utilization of digital technologies such as big data, artificial intelligence, the internet of things, cloud computing and the distributed ledger technology with blockchain has a significant impact in data management among insurance companies. The results also noted that assessing information by employing big data as well as further processing it with artificial intelligence significantly lower expenses and transaction costs of insurance operations. Artificial intelligence also allows insurers to improve customer segmentation by means of pattern recognition compared to conventional approaches. Therefore, the study concluded that there is an interdependency between digital technologies. The study also recommended that insurance regulatory authorities should implement better legal policies that promote integration of digital technologies in the insurance industry.

Another study by Eling and Kraft (2020) investigated on the use of telematics in insurance and its effects on the insurability of risks. The study used systematic review approach to analyse 52 academic papers and industry studies published from 2000 to 2019. The study also used the Berliner's insurability criteria to determine the effects of telematics on the insurability of risks. The results of the study revealed that the use of telematics had a significant effect on information asymmetry, risk pooling and frequency and severity of insurance losses. The use of telematics in the insurance field is subject to ethical and regulatory constraints while the use of the telematics tariffs is hampered by the issues of insurability. Thus, as insurance companies consider implementing telematics in risk management, the study recommends that insurers should first conduct more research on how best it suites their risk management operations, when compared with the other digital technologies that can be used in risk management.

Toniolo, Masiero, Massaro and Bagnoli (2020) study sought to determine the role of AI in supporting sustainable business models' development in multinational companies in US, Spain and Italy. The study relied on analysis of relevant studies about AI and its potential impacts on the economic, social and environmental sustainability of business models. The results of the study indicated that AI had a more significant impact on economic sustainability of business models as compared to the social and environmental sustainability of the business models in multinational companies. In addition, the study also noted that integration of AI had a positive and significant

impact on sustainable performance of the multinational companies. Thus, the study concluded that AI will be an important factor in achieving the United Nations' Sustainable Development Goals.

Further, Johnson, Albizri and Harfouche (2021) also conducted a study to examine the influence of AI in predicting and preventing insurance claim denials in the health sector in US. The study targeted the 24 life insurance companies in US. The researcher interviewed the risk managers in the selected life insurance companies. The study also employed thematic analysis to analyse the data collected from interviews. The study noted that one out of seven health insurance claims from patients in hospitals are rejected. This causes huge cash-flow issues and overburdens patients. The study further, used Design Science Research (DSR) paradigm to develop a Responsible Artificial Intelligence (RAI) model to identify the causes of insurance claim denials in the health sector. The results of the study revealed that the use of AI algorithms can help in predicting false claims and preventing claim denials before claims are submitted to insurers. In addition, the implications of adoption of the RAI model included improve profitability, accelerates the revenue cycle in hospitals and supports patients' wellbeing.

A study by Mikhaylov, Esteve and Campion (2018) discussed on the opportunities and challenges of Artificial Intelligence in the public sector in United Kingdom. The study employed the systematic literature review to analyse previous studies on AI and the cross-sectoral collaborative efforts around AI in the public sector. The study noted that public sector organizations consider implementing AI into their operations to especially help them in delivering policies and ensure efficiency in its operations during high-uncertainties environments. The results from analysis of previous studies revealed that cross-sectoral collaborative efforts between universities, public and private sectors enhanced the integration of AI into public service delivery. In addition, the study also found that successful integration of AI into the public sector will have positive effects on demand prediction and anticipation, automation of demand-side response, identification of high-risk groups and development of targeted interventions, production of goods with higher productivity, lower cost, and better efficiency, promotion of goods and services at the right price, with the right message, and to the right targets, and provision of enhanced public services.

Another study by Allam, Dey and Jones (2020) discussed on how AI provided early detection of the coronavirus in China and its future influence in urban health policy internationally. The study targeted the Bluedot and Metabiota companies that used technologies and AI tools to predict outbreak of diseases in China. The study found that Metabiota and BlueDot have invested heavily in machine learning technologies, Big Data, natural language processing algorithms and web-based start-up to gather data from a wide range of sources including the global Disease Infectious Alert, animal disease reservoirs, news outlets and global airline ticketing data. The findings of the study revealed that the use of web-based start-up to analyse air travel data in Wuhan enable the company to predict the outbreak of Covid-19 pandemic, nine days before the official announcement of the outbreak. While Metabiota used Big Data and Machine Learning to analyze the available data on social media and predicted the next countries that would be impacted besides Wuhan. The study also noted that the use of Big Data has enabled Metabiota company to develop a comprehensive disease database that helps it to extend its scope of services to provide insurance coverage. The study recommended that more data exchange practices should be enforced in the urban health sector while maintaining privacy and security standards, given the sensitive nature of information in the sector.

Moreover, Naudé, Bray and Lee (2022) carried out a study on crowdsourcing of Artificial Intelligence through a data science contest on the largest intermediated digital contest platform in Africa. The total target population of the study comprised of 614 contestants. The results of the study revealed that most of the participants had intermediate and beginner level skills in AI and mostly not formally qualified in data science. The results also indicated that the motivation to participate in the contest was mainly influenced by the intellectual challenge, the opportunity to gain experience in coding and the opportunity to showcase expertise. As a result, the study concluded that promoting participation of data analysts in data science contests may help reduce skills inefficiency in the labor market and educational obstacles to the adoption of AI.

A study by Altenried (2020) assessed the influence of crowd work on the employee performance in business enterprises across different countries. The study noted that crowd work platforms are crucial component in the production, development and support of artificial intelligence. They are newly automated technological methods for labor measurement, management, and control that have made it possible to build extremely adaptable and scalable workforces. The platform is characterized by automated management and surveillance, as well as algorithmically organized cooperation between a large number of workers, particularly on microtask platforms. The results of the study found that crowd work systems offer a global on-demand workforce that can works from their homes or Internet cafes. Thus, making use of labor resources that were previously inaccessible to productive employment. The study concluded that crowd work promotes flexibility in work schedules and can significantly improve the performance of employees.

RESEARCH METHODOLOGY

This study relied on a critical review of previous academic studies on Artificial Intelligence and the insurance industry between 2017 and 2022. This method was chosen since it is more reliable, economical, and efficient in terms of time and resources. In addition, the researcher opted to use recent studies since they provide more updated information on the AI technologies that have significant impact on the insurance industry.

RESULTS

The results of this study were categorized into various research gaps that the researcher identified from the literature review. The research gaps included; conceptual and contextual gaps.

Conceptual and Contextual Gaps

Studies by Naudé, Bray and Lee (2022), Allam, Dey and Jones (2020), Mikhaylov, Esteve and Campion (2018), Toniolo, Masiero, Massaro and Bagnoli (2020) and Elin and Kraft (2020) consisted of conceptual gaps. This is because the studies did not target insurance companies but other companies hence the findings may not be applicable to the insurance industry. In addition, studies by Altenried (2020), Johnson, Albizri and Harfouche (2021), Eckert and Osterrieder (2020), Eling, Nuessle and Staubli (2022), Naudé, Bray and Lee (2022), Allam, Dey and Jones (2020), Mikhaylov, Esteve and Campion (2018), Toniolo, Masiero, Massaro and Bagnoli (2020) and Elin and Kraft (2020) consisted of contextual gaps. This is because most of these studies have discussed the insurance opportunities and benefits at in depth, but failed to discuss on the challenges that insurance firms face in an artificial intelligence society.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that adoption of AI provides a wide variety of opportunities and benefits to the insurance industry especially in risk management, management of customers' data, improving customer experience and insurance claims processes. The challenges that arise from adoption of AI in the insurance industry are mainly on skills and talent management to ensure business efficiency.

The findings of this study will be relevant to the main players in the insurance industry. The management team of the insurance companies will have a better understanding of how the various AI technologies are adopted to the different insurance operations so as to improve business efficiency. The study has also been able to outline the main challenge that the insurance sector experience in the adoption of AI, this will encourage the management to consider investing in training programmes so as to improve the skills of their employees. On the other hand, the policymakers will also benefit from this study when developing better legal frameworks that promote the adoption of AI.

Further, the study will also be useful academically to researchers and scholars by expanding the body of information on insurance and artificial intelligence, which is still scarce. The reviewed studies' highlighted research gaps that can also inspire researchers and scholars to conduct additional research on artificial intelligence and insurance. In particular, the study's key research gap on the insurance challenge experienced in an artificial intelligence society.

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