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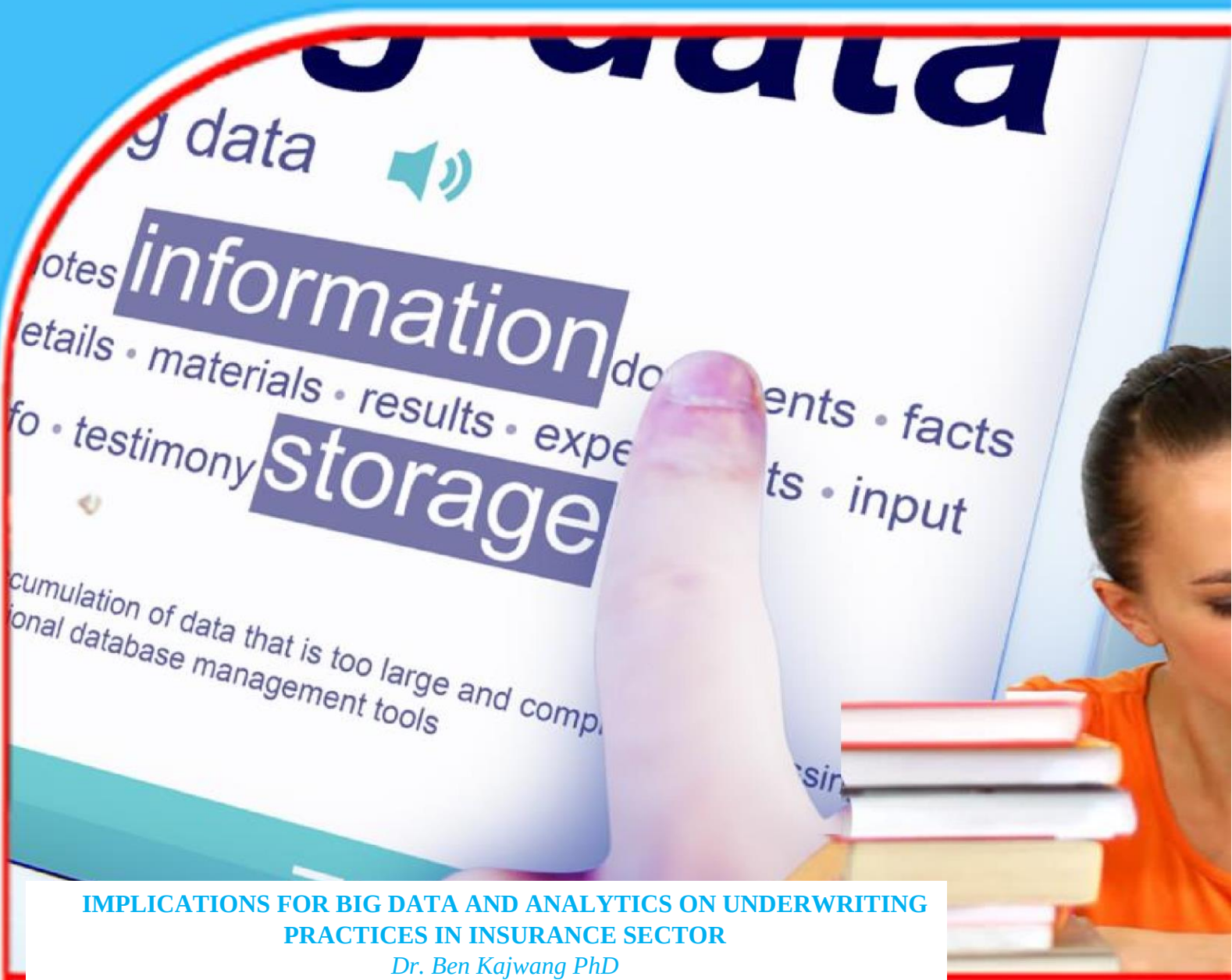

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IMPLICATIONS FOR BIG DATA AND ANALYTICS ON UNDERWRITING PRACTICES IN INSURANCE SECTOR

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ABSTRACT

Purpose: Many businesses' approaches to data management have been revolutionized as a result of the advent of big data analytics. These days, companies are harnessing the power of the insights offered by big data in order to instantly establish more information about their customers and the ways in which they conduct business. The goal of this research is to analyze the implications for Big Data and analytics on underwriting practices in insurance sector.

Methodology: This was accomplished through the use of a desktop literature review. The use of Google Scholar was utilized in order to locate seminal references and journal articles that were pertinent to the study. Papers that were published no more than ten years prior were required to meet the inclusion criteria.

Findings: According to the findings of the study, top insurers' underwriting was significantly impacted by the digitization of their claims processes, which made use of big data and analytics. In this paper, the beneficial role of adopting technologies and tools of big data has been justified. These technologies and tools make it possible to develop powerful new business models, which, in turn, make it possible for the role of insurance to transition from "understand and protect" to "predict and prevent."

Unique contribution to theory, practice and policy: According to the findings of the study, various aspects of building up digital insurance control mechanisms that assist in maintaining the data integrity of underwriting processes should be implemented. When such advanced security frameworks are implemented, data integrity can be assured, and instances of fraud losses can be significantly reduced. In addition to this, there is a requirement for need-based training to be provided to underwriters regarding the implementation of digital management systems. Moreover, insurance companies should take advantage of the opportunities presented by technology in order to provide underwriters with an early warning of any potentially fraudulent activities.

Keywords: *Big Data, Analytics, Underwriting Practices, Insurance Sector*

INTRODUCTION

Insurance has undergone a fundamental shift in the last decade as a result of numerous technological breakthroughs (Bondurant & White, 2019). The underwriting process is fundamentally one of the aspects of the insurance spectrum that has undergone significant revolution in recent decades. The emergence of new technology has the potential to change the way in which insurers underwrite customers, distribute insurance products, collect data, as well as change the behavior of consumers when it comes to the actual purchasing of insurance products. Many businesses' approaches to data management have been revolutionized as a result of the advent of big data analytics. These days, companies are harnessing the power of the insights that big data can provide in order to instantly gain a deeper understanding of their customers and the ways in which they conduct business (Gandhi & Kaul, 2016).

In the context of consumer insurance, the term "big data" refers to the enormous data sets that insurance providers have at their disposal, which enables them to engage in innovative forms of information processing that are both efficient and cost-effective, resulting in improved insight and decision-making (Boyd and Crawford, 2012). In most cases, this is made possible by algorithms that are able to recognize patterns within the vast amount of data sets that are currently available. In predictive analytics, once a pattern has been identified that can be relied upon, it is possible to employ that pattern as the foundation for the operation of the process. The field of analytics known as predictive analytics focuses on forecasting the likelihood of future occurrences as well as the potential consequences of those events. Insurers have been using the fundamentals of predictive analytics for decades, but today it is primarily utilized to produce reliable reports, which precisely identify levels of risk and assist in underwriting and policymaking by using a vast variety of techniques, including data mining, predictive modelling, statistics, machine learning, and artificial intelligence. This is accomplished by utilizing a wide variety of data sources, such as historical claims data, customer behavior data, and market data (Ularu et al., 2012).

Underwriting is a function of insurance that is responsible for assessing and classifying the level of risk represented by the insured or proposed group and making decisions regarding the coverage of that risk. This function is also responsible for determining whether or not the risk should be covered (Bhalla, 2012). For the most part, insurance companies determine a customer's risk based on factors such as age and policy history; however, technology has recently become more pervasive. The availability of massive amounts of historical data, also known as "Big Data," as well as innovative techniques such as machine learning and predictive modeling present an unrivaled opportunity for the industry to modernize the underwriting process. In today's world, insurance companies are able to base their decisions on a more personalized and accurate risk assessment or underwriting process thanks to the increased number of factors that can be taken into consideration (Desalegn, 2014).

Conventionally speaking, underwriting happens when an insurer and an insured sign an insurance contract. In this contract, the insurer agrees to indemnify the insured against losses caused by certain future risks, and the insured agrees to pay periodic premiums to the insurer in return. This exchange is considered to be the beginning of the underwriting process. General underwriting and life insurance underwriting are the two primary categories that can be utilized to classify

underwriting. There are two different kinds of underwriting options available for life insurance policies: simplified issue and fully underwritten. Policies classified as general insurance or non-life insurance, such as automobile and homeowner's insurance, are designed to compensate policyholders monetarily for losses incurred as a result of specific types of financial calamities (Neale, Drake and Konstantopoulos, 2020).

Big data analytics are transforming the insurance industry in such a way that it is now possible to easily collect data from customers and conduct in-depth analysis. This is made possible by the reduction of fraud and wasted time, the expedited pricing of premiums, and the ability for customers to self-servicing their policies. Data analytics contribute to the profitability of their book of business by adjusting sales practices to improve profits, decreasing the amount of time wasted with policyholders, increasing profitability per agent and per customer, and maximizing overall performance for the insurance industry as a whole. An arms race in the development of new applications along the entire insurance value chain has been triggered by the emergence of big data analytics and artificial intelligence. This arms race has been triggered by both InsurTech startups and established insurers (The Geneva Association, 2018).

Big data analytics applications can improve pricing and boost profitability, achieve more precise customer segmentation, and enable stronger risk identification and underwriting efficacy. These benefits can be achieved by achieving all of these things. Customers stand to benefit from increased responsiveness, improved pricing, and customized experiences made possible by sensor inputs, the Internet of Things (IoT), and a wide variety of other applications as a potential outcome of this. Big data analytics is the practice of applying sophisticated methods to the examination of enormous datasets that contain a wide variety of structures, with the intention of locating information that is both relevant and specific. In the insurance industry, it is anticipated that big data will help with underwriting, better pricing and risk selection, product development, better management decisions, loss control and claim management, understanding customer needs, marketing, and sales (Akkor and Ozyukse, 2020).

Automation, data insights and analytics, and underwriting platform-based solutions are some of the key levers that have a major impact on the underwriting value chain, as stated by Schmid (2019). These technological advancements have an impact on risk assessment as well as proactive monitoring, and as a result, they contribute to the mitigation of risk. Therefore, nations that have low insurance penetration rates but a large market and a growing middle class are finding great opportunity in the field of technology insurance. For example, in Brazil, where it has the fourth highest number of internet users in the world, the growth of information and communication technology in the country is brightening up the outlook for the country's insurance industry. This is because Brazil has one of the fastest growing economies in the world (Dimas, 2017).

The China Life Insurance Company Limited made significant strides toward digital transformation across the board in the year 2020 (Shaw & Baumann, 2020). Due to the company's emphasis on satisfying customers, intelligent improvements were made to various online services. By utilizing Internet video and other forms of intelligent identification technology, "Contactless Services" enabled customers to access insurance services without leaving the comfort of their own homes. The intelligent claims settlement model for health insurance, which was developed on the basis of

big data and AI technologies and covered key risks in five different categories, made claims settlement services more effective and convenient (Eckert & Osterrieder, 2020).

Statement of the problem

It is anticipated that big data and analytics will lead to improved underwriting practices in the insurance sector. However, in the real world, the underwriting practices that are used in the insurance industry have been poorly implemented. The failure of insurance companies to properly implement strategies based on big data analytics is the root cause of this problem. The various parties involved face a significant obstacle as a result of this, and it is imperative that they find a solution to the issue as soon as possible. Previous research has been done in the hopes of determining whether or not there is a correlation between the use of technology and the efficiency of the underwriting processes. On the other hand, they did not depict in an understandable manner the connection between big data and analytics and the efficiency of the underwriting processes. Due to the lack of available literature, it is clear that research is being done in an effort to establish the implications of big data and analytics on underwriting practices in the insurance sector.

LITERATURE REVIEW

Diffusion of Innovation Theory

In 1962, Rogers presented the theory of the diffusion of innovation, also known as DOI. Rogers came to the conclusion that innovation would eventually gain widespread favor and disperse or spread. Following the process of diffusion, individuals develop a novel concept or item. Rogers advocated for the necessity of conducting research on innovation and the roles it plays in society. Rogers identifies five characteristics that should be taken into account during the innovation process. These characteristics include a relative advantage, which evaluates the benefits of an innovation in relation to those of its alternatives; compatibility between the innovation and the processes that are already in place; the complexity of the innovation, according to which complex innovations are less likely to be considered; trialability, according to which users are content with innovations that they have tried out; and observability, according to which people who are a part of a culture system prefer innovations that have been used (Rogers, 2003). This theory asserts that more research into innovation and its functions is needed, and that people appreciate it when it is put to good use. This paper examined the use of big data analytics on underwriting practices in the insurance industry.

Empirical Review

There has been a study on big data analytics in the insurance sector by Moturi et al. (2022). Big data analytics capability (BDAC) was examined in connection to a firm's competitive performance via the mediating role of dynamic and operational capabilities in this study. Using data from 110 employees from 54 insurance businesses in Kenya, they tested their research methodology. The results of structural equation modeling using partial least squares partial least squares show that the ability to use big data analytics leads to better business performance. This paper proposes an instrument for measuring big data analytics capabilities, which includes a list of various resources. Using the conclusions of this study, big data analytics projects can be planned and implemented.

When conducting a study on big data and competitive advantage in Nairobi's commercial banks and insurance businesses, Ndambo (2016) sought to find out the extent to which big data analytics was being used, as well as the link between big data analytics' use and the competitive advantage of these institutions in Nairobi. Descriptive surveys were utilized in this study to gather data for analysis. Researchers in Nairobi, Kenya, focused their attention on commercial banks and insurance businesses as a possible population for this study. As of the most recent count, Nairobi is home to 42 commercial banks and 49 insurance firms. Data collection and analysis were limited, so a sample of 20 commercial banks and 25 insurance companies was chosen. Rather than secondary sources, this study relied on information gathered through the use of structured questionnaires. Managers in charge of company strategy and/or information technology in the selected companies were the respondents. Frequencies, percentages, means, standard deviations, and regression analyses were used to examine the data. Consumer and customer behavior may be reported and analyzed thanks to investments in data storage and advanced business intelligence technologies made by financial services corporations, notably commercial banks and insurance companies. Using these technologies, firms can better predict the needs of their customers, as well as improve their operational efficiency. To make better decisions in the big data environment, firms are incorporating big data analytics technology into their daily operations. The full potential of big data tools and diverse analyses can be realized if the management of big data is handled, especially in terms of competitive advantage. The outcomes of this study were subjected to an in-depth examination, and the researchers came to the conclusion that the big data revolution has taken root in the commercial banking and insurance industries in Nairobi. Furthermore, the researchers believe that this trend will continue to grow as commercial institutions continue to unearth the precious data with enormous potential that has been sitting in their storage facilities for decades.

In his study, Onyango (2021) looked into the relationship between Kenyan insurance businesses' IT capability and performance. Information technology innovation, artificial intelligence, big data analytics, and digital communications are among the ICT capabilities explored. This study used a correlational research approach. The respondents were emailed a link to the survey, which was created using Google Forms. The study's participants were insurance company IT managers. A total of 56 IT managers from Kenyan insurance businesses were surveyed for this study. The study found that insurance businesses' performance was boosted by their ICT capabilities. Most insurance companies use big data analytics to gather customer information from a variety of sources during the underwriting or claim processing process, and then securely store and analyze the information in order to generate dashboard reports. Independent factors IT innovation and artificial intelligence had a considerable impact on insurance businesses' performance, but big data analytics and digital communication had a little effect, according to the study's conclusions from regression analysis. An insurance technology start-up cooperation is recommended by the study to help insurance companies perform better in the long run. Another recommendation made by the researchers is to use artificial intelligence capabilities like machine learning and chatbot advisers to help insurance businesses better understand their customers and their needs. The findings of this study will help insurance companies, politicians, and academics better understand how to use ICT to improve the performance of Kenyan insurance businesses.

There was a study done by Rana, Bansal, and Gupta (2022) on the Insurance Market's Emerging Big Data Technologies. Researchers looked at what impact AI, blockchain, and mobile technology are having on the insurance industry. They looked at case studies and scholarly works that demonstrate the transformative power of big data analytics in the insurance industry. Many papers and studies on big data analytics in the insurance industry have been culled for this project. After conducting an extensive study, the researchers concluded that the usage of big data in insurance has increased. There are numerous advantages to using big data analytics in insurance, which has made it a game-changer. Risks and opportunities presented by contemporary technology are being examined by insurance companies. Every business should take use of the possibilities presented by big data. Big data has unquestionably impacted the insurance industry in a positive way. Insurers have been able to better target their customers thanks to the results of big data analytics. This chapter emphasizes the rise of new big data tools and technology in the insurance industry. Artificial Intelligence (AI) has the potential to transform the whole insurance value chain. Blockchain might be used to transmit any sort of digital proof for underwriting, including the usage of digital health data. There will be changes in pricing and product design as digital forensics becomes more widely accepted as a kind of insurance.

Ngiri (2021) conducted a research study to investigate the impact that the incorporation of technology has had on the underwriting procedures of the top five insurance companies in Nairobi County. The research utilized a design that was descriptive of surveys. The population of interest consisted of 1,174 staff members working for the top five insurance businesses in Nairobi County. In the research, a method called stratified sampling was utilized to select 298 workers from the various insurance companies to take part in the survey. The study relies on first-hand accounts and observations. The usage of structured questionnaires was the method that was utilized for the collecting of the data. The findings on the effect of digital claim processing on the underwriting process among the top five insurers in Nairobi County indicated that the majority of insurers agreed that automation ensures that the insured provided accurate information that was verifiable during the investigation. These findings were found in the report on the effect of digital claim processing on the underwriting process. Positive but not strong was the relationship that existed between the underwriting process and the computerized processing of claims. In addition, the data demonstrated that the utilization of digital claim processing had a favorable and discernibly important impact on the underwriting procedure utilized by insurers in Nairobi County. Most insurers in Nairobi County's top five insurance companies agreed that customer service given by employees was a priority entrance into the company without surpassing, according to research on the impact of customer relationship management systems on the underwriting process. Both the customer relationship management system and the underwriting process benefited from the close connection that existed between the two. In addition, the data demonstrated that the customer relationship management system had a favorable and discernibly important impact on the underwriting procedure utilized by insurers in Nairobi County. According to the findings of the survey, leading insurers' underwriting was greatly impacted by elements including the digitalization of their claims processes as well as their customer relationship management systems. According to the findings of the study, insurance companies should implement certain features of developing digital insurance control mechanisms. The research goes on to suggest that insurance

companies look into expanding their customer relationship management software by making an investment in it.

A study that was conducted by Senousy, Mohamed, and Riad (2018) on recent trends in big data analytics towards more improved insurance business models was presented. In this piece of research, the authors examine the benefits that big data technology offers in comparison to the requirements for data processing and decision-making in the insurance industry. A case study analysis that centers on the most important applications of big data in the insurance industry is also presented here. The paper also provides an overview of the most important big data technologies and tools from the point of view of the insurance industry. The report also gave some analytical review that validated a number of obtained benefits by the insurance businesses. These benefits included the effective processing of vast different data sets as well as the backing of better decision making. This article provides a comprehensive assessment of the top seven use cases of big data in insurance, as well as justifications for the use of each use case and the value that it adds. In addition to this, it provided an overview of the most modern big data technologies and tools, with a particular emphasis on the fundamental concepts behind them and the recommended applications of each, illustrated with examples from the insurance business. In this paper, the beneficial role of adopting technologies and tools of big data has been justified. These technologies and tools make it possible to develop powerful new business models, which, in turn, make it possible for the role of insurance to transition from "understand and protect" to "predict and prevent."

The influence that big data and AI will have on life insurance underwriting was investigated by Burke (2021). Interviews with qualified witnesses were done in a semi-structured format for the purpose of this study. It was decided to take a representative sample of management-level personnel from a wide range of business operations within the industry. These activities included actuarial work, machine learning, data analytics, legal work, and data science. Throughout total, eight interviews with subject matter experts took held in the month of March 2019. The results of the investigation were examined using a technique called thematic content analysis. Throughout the course of this research, a number of important findings emerged. It has been demonstrated and validated that the utilization of accelerated underwriting as well as wearable technology has the ability to bring about considerable performance gains to the operations of life insurance companies. According to the findings of the study, two of the primary factors contributing to this spread are falling prices and rising profits. Facial analytics, which is interesting because it is proposed as a simple approach to engage clients despite the fact that there are no significant performance benefits to be achieved from this to stimulate adoption, is therefore nothing more than an incremental innovation. On the topic of the utilization of non-traditional data, the experts were unable to come to a decision that was acceptable to all of them. When paired with faster underwriting, it has the potential to bring about performance improvements.

In this study, Dahiya et al. (2022) investigate the application of big data analytics in the Indian insurance sector. They accomplish this by carrying out an in-depth literature review on big data in a methodical manner. Their primary focus is on accumulating data regarding the five Vs of big data and the insurance industry. More specifically, the role that big data can play in the process of making decisions based on data. According to their findings, big data technology has produced an

unending sequence of opportunities, which has insured a boom in the amount of people using it. [Citation needed] Businesses have been able to make the process more methodical and cost-effective as a result of its implementation, and it has also contributed to a reduction in fraud and improved risk prediction.

METHODOLOGY

The investigation utilized a desktop research approach. The term "desk research" refers to the collection of secondary data or information that does not need actual fieldwork. Desk research is essentially the process of gathering data from already existing resources. As a result, this method is frequently considered to be a low-cost technique in comparison to field research. The primary costs involved in desk research are the executive's time, telephone charges, and directories. As a result, the research relied on previous research, reports, and statistics that had been published. Through the use of online journals and the library, this secondary data may be accessible very quickly.

RESULTS

The results were grouped into various research gap categories namely as knowledge and methodological gaps.

Knowledge Gaps

Studies by Moturi et al., (2022), Ndambo, (2016), Onyango, (2021), Rana, Bansal and Gupta (2022), Ngiri (2021), Senousy, Mohamed and Riad (2018), Burke (2021) and Dahiya et al. (2022) had knowledge gap. In addition, all the mentioned studies did not establish implications for big data and analytics on underwriting practices in insurance sector. Therefore, the current study seeks to address these knowledge gaps.

Methodology gaps

Studies by Moturi et al., (2022), Ndambo, (2016), Onyango, (2021), Rana, Bansal and Gupta (2022), Ngiri (2021), Senousy, Mohamed and Riad (2018) and Burke (2021) had methodological gap. In addition, all the mentioned studies did not employ desktop review methodology. Therefore, the current study seeks to address these methodology gaps.

CONCLUSION

The findings of this study, which were subjected to a comprehensive analysis, led the researchers to the conclusion that the revolution sparked by big data has found a home in the commercial banking and insurance industries, and that this trend is only going to continue to grow as these businesses continue to unearth the valuable data with enormous potential that has been sitting in their storage facilities for decades. The utilization of big data presents a number of opportunities for businesses, which should not be ignored. We are confident in asserting that the application of big data has positively impacted the field of insurance. The repercussions of big data analytics have made it possible for insurers to target customers with more precision. This study illustrates the fact that new tools and technologies related to big data are becoming increasingly prevalent in the insurance business.

The research also came to the conclusion that the digitalization of claim procedures through the use of big data and analytics had a substantial impact on the underwriting practices of leading insurers. In this paper, the beneficial role of adopting technologies and tools of big data has been justified. These technologies and tools make it possible to develop powerful new business models, which, in turn, make it possible for the role of insurance to transition from "understand and protect" to "predict and prevent."

RECOMMENDATIONS

According to the findings of the study, several aspects of building up digital insurance control mechanisms that assist in maintaining the data integrity of underwriting procedures should be implemented. When such advanced security frameworks are implemented, data integrity may be assured, and instances of fraud losses can be considerably reduced. In addition to this, there is a requirement for need-based training to be provided to underwriters regarding the implementation of digital management systems. In addition, insurance companies should take advantage of the opportunities presented by technology in order to provide underwriters with an early warning of any potentially fraudulent actions.

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