

CAUSES AND CONSEQUENCES AND PREVENTION OF INSURANCE FRAUD -A SYSTEMATIC LITERATURE REVIEW

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Abstract

The insurance industry has always been crucial to the economy and society's progress worldwide. In reality, insurance confronts many risks, one of which is Insurance fraud. Insurance fraud is increasing rapidly along with the growth of the insurance sector, which causes serious social and economic issues. The damage caused by insurance fraud has been continuously increasing, making the insurance companies harder to manage. As a result, the insurance premiums have risen, which in turn causes losses to good policyholders. As the world is at the pace of rapid innovation with the emergence of the industry revolution 4.0, the Insurance sector is adopting advanced technology, making many positive changes in the insurance industry with the introduction of Artificial Intelligence. In this study, the authors focus on Systematic Literature (SLR) confined to the reasons insurance fraud happened in various segments, the parties involved in it, its consequences, and also to take preventive measures by adopting AI technology to reduce insurance fraud. The paper focuses on creating an outlook of Insurance fraud from a holistic perspective by interconnecting the issues relating to various insurance areas and finding solutions to mitigate insurance fraud. The findings of this paper make academics conscious of the significant role of technology, including AI and ML modes, in detecting and preventing insurance fraud.

Keywords: Insurance, Insurance Fraud, Fraud Detection, Information Technology, Artificial Intelligence.

1. INTRODUCTION

Insurance is a prominent sector where the economic life of humans can be stabilized by dispersing the risks of societies and individuals (Yang-bok, 2017). It is considered a risk management tool that aims to reduce risk in the day-to-day lives of individuals, organizations, and society. In reality, insurance confronts many risks, one of which is Insurance fraud (Syamkumar, 2023.). Fraud is intentionally causing harm to one person, organization, or society by concealing the facts. Fraud had become a problem needing combined attention in the travel, motor, home, and business covers in the late 1980s (Clarke, 1989). Insurance fraud occurs if insurance consumers were inflated by an accident that did not occur to defraud the

insurance money (Jun Han-Deok, 2020). Insurance fraud is increasing rapidly along with the growth of the insurance sector, which causes serious social and economic issues (Sung Tae Kyung, 2003). However, insurance companies are at the forefront of adopting many technical operations to maximize profit while servicing their customer's claims (Dhieb et al., 2020). The damage caused by insurance fraud has been continuously increasing, making the insurance companies harder to manage. As a result, the insurance premiums have risen, which in turn causes losses to good policyholders. This situation arises because the prevention of insurance fraud is considered to be the least important.

Insurance fraud has become a serious social problem that destroys the insurance ecosystem (Hoon, 2020; Kim & Kyun, 2018). With the growing number of cases, the authorities are forced to enact legislation, including revising current laws, such as the Criminal Act and the Insurance Business Act, to overcome the situation (Hoon, 2020). Even after the law's implementation, the rate of insurance fraud continues to increase, and punishment for these crimes has not been strengthened (Woo, 2019). Thus, the Insurance sector introduced a special law for reducing insurance fraud, namely 'The Act for Prevention of Insurance Fraud', which works more practically to enact insurance fraud prevention (Hoon, 2020; Hoshin, 2021). Insurance fraud is a very nasty crime; our society should continue to cope with it in all its efforts.

The world is at the pace of rapid innovation with the emergence of the industry revolution 4.0. This is reflected in the field of Insurance with the introduction of Artificial Intelligence. The level of transformation by adopting advanced technology makes a lot of positive changes in the insurance industry. Data analytics extract valuable information (trends and patterns) in inclusive insurance businesses. The outcome of data analytics can be used in many operations, such as detecting fraud, enhancing efficiency in business operations, identifying risks, and influencing decision-making in an organization (Chummun, 2018). Blockchain technology is widespread in detecting and preventing Insurance fraud in the new era.

Insurance fraud can be witnessed widely among the different insurance policies (Syamkumar, 2023.) Many kinds of literature have studied the concept of Insurance fraud from different perspectives. In this study, the authors discuss various aspects of insurance fraud. However, limited studies have been made about insurance fraud and artificial intelligence. In the proposed study, the authors focus on an SLR confined to the reasons insurance fraud happened in various segments, the parties involved in it, its consequences, and also to take preventive measures by adopting AI technology to reduce insurance fraud. The paper focuses on creating an outlook of Insurance fraud from a holistic perspective by interconnecting the issues relating to various insurance areas. Secondly, the study assesses fraud detection and prevention by enacting special laws to resolve insurance fraud. Finally, the study pertains to determining the role of Artificial Intelligence techniques in reducing Insurance fraud activities as a future agenda.

The paper finds that the themes show highly developed and relevant themes on which the authors work: fraud detection, usage of machine learning, reduction of health insurance fraud risk, data mining, automobile insurance fraud, etc. The niche theme of insurance fraud depicts the most developed concepts under insurance fraud. Here, we find epidemiology, motor vehicle

accident claims, aggregate claim models, and claim severity in the niche theme. The basic themes show highly relevant themes but are not developed much and have scope for development later. Moral hazards, asymmetric information, and adverse selection are basic themes that forecast future development. The emerging themes show a future research agenda in areas like the hierarchical Bayesian model, bonus-malus system, etc., which form the emerging areas that need academicians' attention. The paper has the following sections. Section 2 deals with the theoretical background, and section 3 covers our rationale for an SLR. Section 4 covers research questions, and section 5 includes results and discussions. Section 6 covers the thematic mapping of insurance frauds, and finally, section 7 deals with the summary and conclusion of the paper.

2. THEORETICAL BACKGROUND

2.1 Insurance fraud

Insurance is a contractual relationship between the insurer party and policyholder by agreeing to payment of a premium, to make monetary provision on behalf of an insured party to cover after a formal claim has been filed by a (first- or third-party) claimant party, the loss of an insurable interest due to one or more future, well-defined, but uncertain events (Viaene & Dedene, 2004). The parties are responsible for having the utmost good faith throughout their dealings. Fraud can be described as a crime for illegitimate financial gain using deception as its principal modus operandi (Henry, 2021). The Association of Certified Fraud Examiners (ACFE), a worldwide anti-fraud organization and a major provider of educational and training programs against fraud, identifies fraud as an act of deception or mistakes made by a person or an entity that knows that the mistake could result in some benefits that are not good to the individual or others (Barnes, 2020). Insurance fraud is a persistent problem in the insurance industry, causing huge damage. The International Association of Insurance Supervisors (I.A.I.S, 2007) defines Insurance fraud as “an act of omission intended to gain dishonest advantage by the fraudster for other parties” (Akomea et al., 2016). According to Derrig (2002), Insurance fraud is a criminal act involving obtaining financial gain from an insurer or insured using misrepresenting facts or pretences. Fraud may be committed at different points by applicants, policyholders, third-party claimants, or professionals who provide services to claimants. Insurance agents and company employees may also commit insurance fraud.

2.2 Types of Insurance Frauds

Insurance frauds are categorized as opportunistic insurance fraud and planned insurance fraud. Opportunistic insurance fraud refers to an individual's post hoc realization that an insured event can be exploited for personal gain by providing false information or exaggerating the legitimate claim. Planned insurance fraud refers to a deliberate attempt to invent a risk event that would be covered under the insurance policy (Derrig & Zicko, 2002). Tennyson (1997) opined that opportunistic insurance frauds are more frequent than planned insurance frauds by comparing people's reactions towards these frauds. According to Akomea et al. (2016), insurance fraud is divided into Internal and external fraud. The basis for this classification is to identify whether insurance fraud is committed within or outside an insurance company. Yusuf (2010) studies

that two kinds of fraud happen within the insurance company in the form of internal fraud: the insurer commits one, and employees commit the other, as both are committed by workers within the company. Akomea et al. (2016), external fraud includes fraud committed by consumers or policyholders against the insurer (policyholder fraud); and fraud committed by independent brokers or agents against the insurers (intermediary fraud). External fraud comes in the form of policyholder/consumer fraud against the insurer in the purchase of an insurance policy or execution of claims by obtaining wrongful coverage or payment (Derrig, 2002; Yusuf, 2010)

Insurance fraud is classified as (1) internal vs external, (2) underwriting vs. claim, and (3) soft vs. hard (Viaene & Dedene, 2004). Internal fraud is committed by insiders of the insurance industry, such as insurers, agents, brokers, managers and other insurer employees or representatives. External fraud is fraudulent activity by outsiders of the insurance industry, such as applicants, policyholders, and claimants, made immorally with insiders such as agents, brokers, or third-party service providers. Underwriting fraud includes fraudulent acts carried out at renewal of the insurance contract and covers, whereas claim fraud is deliberately making fictitious or false claims. Soft frauds are accidental as they are associated with the unwanted opportunistic behavior of normally honest people, generally depending on the stakeholder using the vocabulary. However, hard frauds are similar to claim frauds and tend to be associated with carefully premeditated and minutely executed scams to twist the insurance.

2.3 Causes and Effects of Insurance Fraud

Insurance fraud is a salient economic problem for insurance industries and national economies (Yusuf, 2010; Tseng & Su, 2013). According to Viaen et al. (2004), a fraudulent activity exists with the presence of the following elements such as (1) material misrepresentation (in the form of concealment, falsification, or lie), (2) intent to deceive, and (3) aim of gaining an unauthorized benefit. Insurance fraud occurs if a person or persons lie to an insurer, intermediary, or any other party to gain an advantage, and it can happen either at the underwriting stage or while lodging a claim (Button, 2012). Common frauds include "padding" (inflating claims), misrepresenting facts on an insurance application, submitting claims for injuries or damage that never occurred, and staging accidents. To understand the causes of insurance fraud, researchers started exploring customers' attitudes toward fraudulent behaviours (Cummins & Tennyson, 1996; Netemeyer et al., 2004). Individuals' ethical attitudes (EA) toward insurance fraud depend upon the social or cultural environment, and people seem to be more tolerant when they have negative perceptions of insurance institutions (Tennyson, 1997). Tennyson (2008) says that social attitudes regarding insurance fraud will affect individuals' beliefs and actions toward fraud. He concluded that the effect of fraud on organizations is mistrust of relationships.

The major causes of Insurance fraud are making fictitious data/information in the insurance policy, multiple contracts with companies on the same insurable item, weak internal controls, poor remuneration of employees, falsified documents, theft, and deliberate acts of policyholders to profit from the insurance contract and inadequate training for independent brokers (Akomea et al., 2016). Insurance fraud is considered one of the categories of white-

collar offences, which are financially motivated nonviolent crimes (Piquero et al., 2005). Several factors push people to commit fraud, as explained in the Fraud triangle. According to the fraud triangle, the causes for insurance fraud are financial or work pressure, monetary incentives, providing opportunities for committing fraud due to poor internal controls and inexperienced intermediaries, overconfidence or capability of the policyholders /intermediaries by rationalizing their beliefs or feelings (Akomea et al., 2016; Anand et al., 2004; Derrig 2002). et al. (2016) have opinioned that employee fraud interrupts business operations, wastes time, damages reputation, and causes pecuniary loss.

2.4 Fraud Detection and Prevention

Insurance fraud occurs when an individual or organization provides false or misleading information to an insurance company to obtain coverage or pay a claim (Akomea et al., 2016). This type of fraud can take many forms, including providing false information about the value of insured property, misrepresenting the nature or severity of an injury or loss, or failing to disclose relevant information affecting the insurance company's decision to provide coverage.

Insurance fraud can be costly for insurance companies if the claimants have provided accurate information, leading to higher premiums for policyholders as insurance companies seek to recoup their losses. While discussing fraud issues, it is noteworthy that insurance contracts between the company and the insured are agreements to pay for accidental damages when they occur. The insurance business is to pay claims promptly and efficiently in case of accidents, even fabricating or causing them to happen. The claim adjusting process is in the context of the claimant knowing exactly what happened and the company knows some of what happened to the point that an appropriate payment is made or the claim is denied (Derrig, 2002). The insurance frauds make the insurance companies harder to manage, and as a result, the insurance premiums have risen, which has caused a lot of damaging good policyholders. Insurance crime is common in nature, irrespective of its category. The main reason for the increase in insurance fraud is the lack of proper investigation by experts and the avoidance of the investigation itself. The Government of Austria has added a strict regulation of insurance abuse to prevent general insurance fraud, leading to a new investigation method (Ho, 2021). The basic problem faced by the insurers relating to fraud and systemic abuse is to devise a mechanism that efficiently sorts claims into brackets requiring additional information at a cost (Derrig, 2002).

Insurance companies typically conduct thorough investigations of applicants and claims to prevent insurance fraud, using various tools and techniques to verify information and detect fraud. Many fraud-detecting methods are background checks, insured property inspections, medical records analysis and other documentation. As a result of many discussions, 'The Act for Prevention of Insurance Fraud', a special law, has recently been enacted. After two years, there is debate about its effectiveness. This is because even though the law was enacted and enforced, insurance fraud continues to increase, and punishment for these crimes is not strengthened (Woo, 2019). Even though there is an Insurance Fraud Prevention Act, the author pointed out the demand for the new additional Special Act related to Insurance fraud detection and prevention is high as it is a social issue. Developing an institutional strategy through an investigation team will effectively resolve the cases relating to insurance fraud by conducting

an objective investigation relatively quickly and fairly rather than a biased investigation by an insurance company, and the inconvenience of many goodwill policyholders may be minimized (Yang-bok 2017). Hence, from all this information obtained, it is clear that fraud detection and prevention need to progress much more.

2.5 Financial Implications of Insurance Fraud

Insurance fraud is an illegal act involving acquiring a financial advantage through falsifying an actual position (Derrig, 2002). The common performance management indicator in the insurance industry is financial, which can be measured by monitoring profitability levels (Soteriou & Zenios, 1999). Profitability is an important requirement for the continuity, advancement, and strategic uniqueness of insurers and the most economical source of funds (Chudgar et.al, 2013).

The increase in insurance fraud raises insurance premiums, puts pressure on insurance companies' financial stability, and harms insurance claims (Chudgar et al., 2013). The Association of Certified Fraud Examiners reveals that average organizations lose 5% of their revenue annually due to fraud, translating to roughly \$3.5 trillion globally. Out of this, insurance fraud accounts for over \$40 billion annually, consisting of premium diversion, policy twisting, asset theft, and employers' pay-off fraud.

According to the Coalition Against Insurance Fraud (2015), 10% of the annual insurance losses are due to fraud. The same report indicates that fraudsters steal \$80 billion per year in all lines of insurance. Fraudsters divert resources to non-productive purposes, which hinders the organisation's efficiency and productivity. Insurance fraud leads to a distortion in the relationship between the firm and the customer. As a result, they are forced to establish fraud risk management practices to improve the firm's performance (Doig et al. 2021).

Risk monitoring is a continuous process of tracking uncertainties to avoid a negative impact on a firm's performance (Gachuru, 2020). The effect of insurance fraud can be measured quantitatively and qualitatively (Anand et al., 2004). The financial performance of an insurance firm shows the result of the fraud activities by referring to the return on Assets. The main challenges faced by the insurance industry regarding insurance fraud in the country include the clients and employees, delays in claim settlement, high claims, structural weaknesses, delayed premium collection, poor governance, low economic growth, industry saturation, low penetration of insurance services and lack of liquidity leading to collapse of some firms (Gachuru, 2020).

2.6 Information Technology-Enabled Fraud Detection

Information Technology has developed over the years, and its presence is most important in all sectors. The insurance sector uses IT mostly in the administration and fraud detection areas. Kyung (2003) in his study pointed out the relevance of IT in detecting Insurance fraud. The major focus was to empirically and practically verify the applicability of visualization data mining tools in detecting real-world insurance frauds, which emerged as one of the most serious problems socially and economically. The results show that Analyst's Notebook not only detects

insurance fraud transactions from many insurance claims but also identifies organized crime groups by associating one fraud transaction with another. Data mining plays an important role in Financial Fraud Detection, as it revamps hidden truths behind very large quantities of data (Ngai et al., 2011). Data mining is a process that uses statistical, mathematical, artificial intelligence, and machine learning techniques to extract and identify useful information and subsequently gain knowledge from a large database. According to him, six data mining application classes are supported by a set of algorithmic approaches to extract the relevant relationships in the data, which includes Classification, Clustering, Prediction, Outlier detection, Regression and visualization (Turban, 2007). In a SLR, Ngai et al. (2011) focused on applying data mining techniques in financial fraud detection. The study throws light on financial fraud detection in various sectors. One is the insurance sector, where crop, healthcare and automobile insurance is undertaken. The result found was that financial fraud detection was more prevalent in the insurance sector compared to others with the help of various data mining techniques. From all the studies, it is proven that Insurance fraud is a challenging issue worldwide, and the application of IT plays a major role in the detection and prevention of the same.

2.7 Role of Artificial Intelligence in Insurance Fraud

Digitalization integrates the analogue and digital worlds with new technologies that enhance customer interaction, data availability, and business processes (Eling & Lehmann, 2018), which provides avenues to mitigate insurance fraud. Big data provides vast information from various sources. For insurance firms, big data provides a wealth of information that can be used to detect and prevent fraud. Big data creates detailed profiles of individuals and entities by collecting and analyzing data from various sources (Biju et al., 2023). This helps insurance companies comprehensively understand a person's behaviour and history, making it easier to identify fraudulent activity. Insurance companies can also use big data to detect anomalies in claims data.

According to the Report of the EIOPA expert group on digital ethics (2021), the opportunities and risks associated with the growing use of Artificial Intelligence in insurance aim to help insurance companies by guiding how to implement key principles in practice throughout the lifecycle of an AI application. The key principles include proportionality, transparency, fairness, human oversight, data governance and performance of AI systems. The report also emphasizes the governance pillars for ethical and trustworthy AI in insurance to ensure fairness and good consumer outcomes. In the Insurance industry, AI is set to transform underwriting service delivery to customers, claim and settlement, marketing and fraud detection. Insurance companies can use advanced analytics techniques like machine learning, predictive analytics, and social network analysis to improve their fraud detection capabilities.

A literature review is a systematic review of the existing body of data that identifies, evaluates, and synthesizes for explicit presentation (Fink, 2010; Geetha & Biju, 2024). Lambert et. al (2012) define a literature review as a critical analysis of what is known about the study topic, the themes related to it, and the various perspectives expressed regarding the topic. The literature review is a broad, comprehensive, in-depth, systematic and critical review of

scholarly publications, unpublished scholarly print materials, audiovisual materials, and personal communications. This study aims to do a systematic literature review of insurance fraud holistically, which attempts to analyse the causes and aftermath of insurance fraud and the contributions of artificial intelligence to mitigate the issues about the same. While conducting the study, many reviews were considered, but rare studies ensure the application of AI to Insurance fraud as it is a new arena. The keywords used in the study are *Insurance, Insurance Fraud, Fraud Detection, Information Technology and Artificial Intelligence*. Fig. 1 identifies the most relevant authors who expressed their outlooks on insurance fraud and its related areas. The most prominent authors who study the various areas related to insurance fraud are Ayuso M and Guillen M, who contributed many articles related to Automobile Insurance fraud. In their studies, they researched detecting fraud behaviour and estimated the influence on the probability of committing fraud by the concerned parties. Tennyson has contributed over 11 articles on insurance fraud, and the main focus of her studies emphasises the moral and ethical impacts of insurance fraud in various fields, especially in automobile insurance. Various perspectives of Insurance fraud articles have been studied by authors like Donnie, Derrig AViaenes, Bermudez Liu , Yan and many more. However, limited studies focused on a holistic perspective of insurance fraud from the causes, consequences, and prevention about considering the role of AI in reducing insurance fraud.

Researchers from eminent universities mostly undertook insurance fraud studies. Fig 2 clearly states that the contributions concerning the concept of Insurance fraud from different perspectives are undergone in eminent universities like the University of Barcelona, where 19 articles were published in the category of Insurance fraud. HEC Montreal follows it with 15 articles, University of Wisconsin Madison and University De Montreal with respectively 14 articles and so on. Our review helped us understand the more pertinent authors in Figure 1. Figure 2 reflects the author's affiliations in insurance fraud risk management.

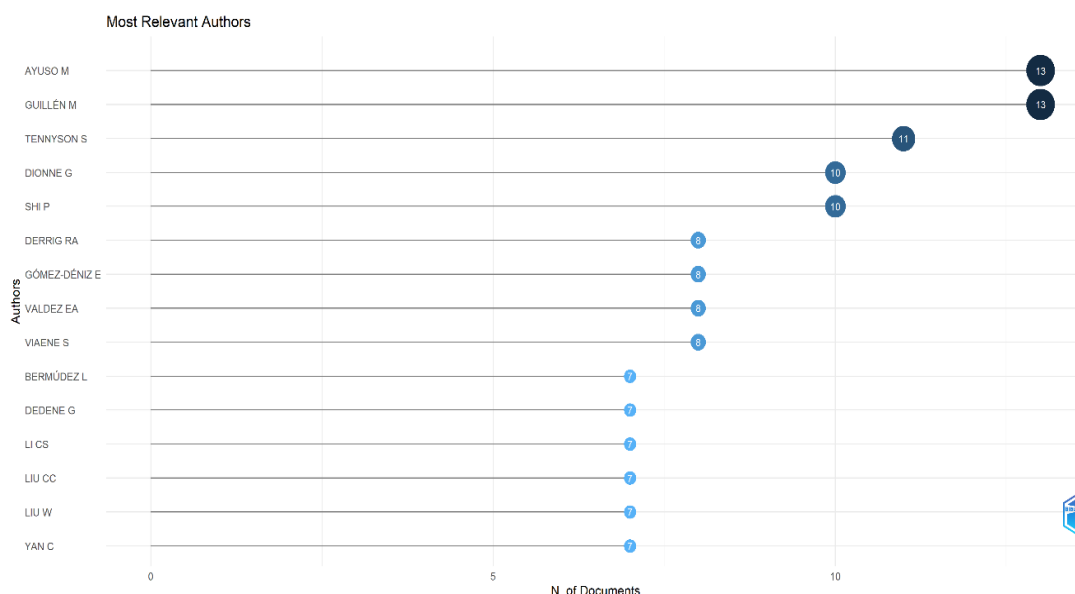


Figure 1: Relevant authors in the field of Insurance fraud risk management

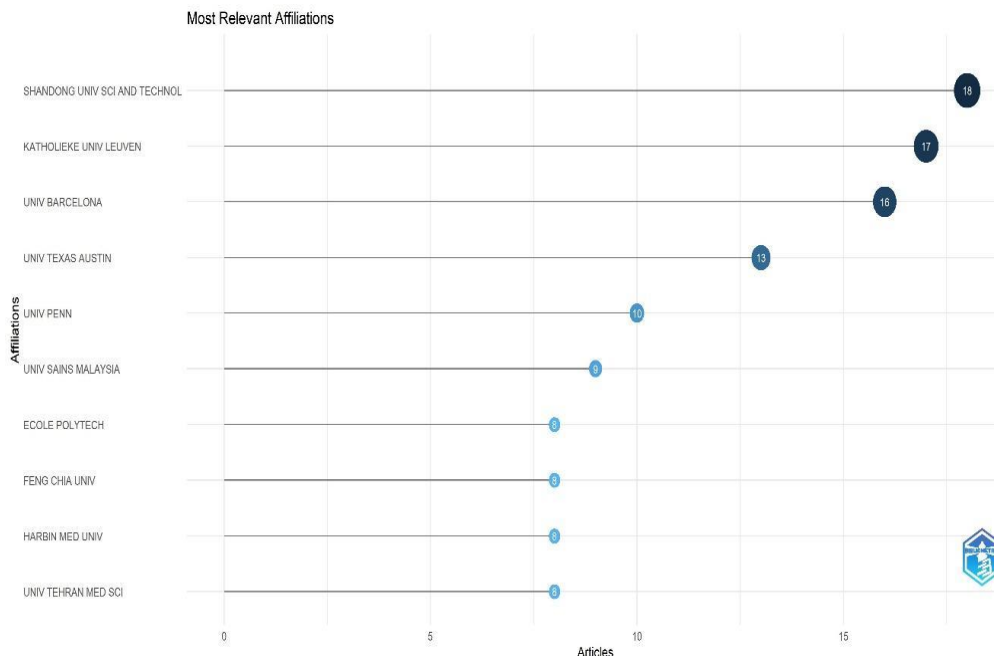


Figure 2: Most relevant affiliations of authors in Insurance fraud risk management.

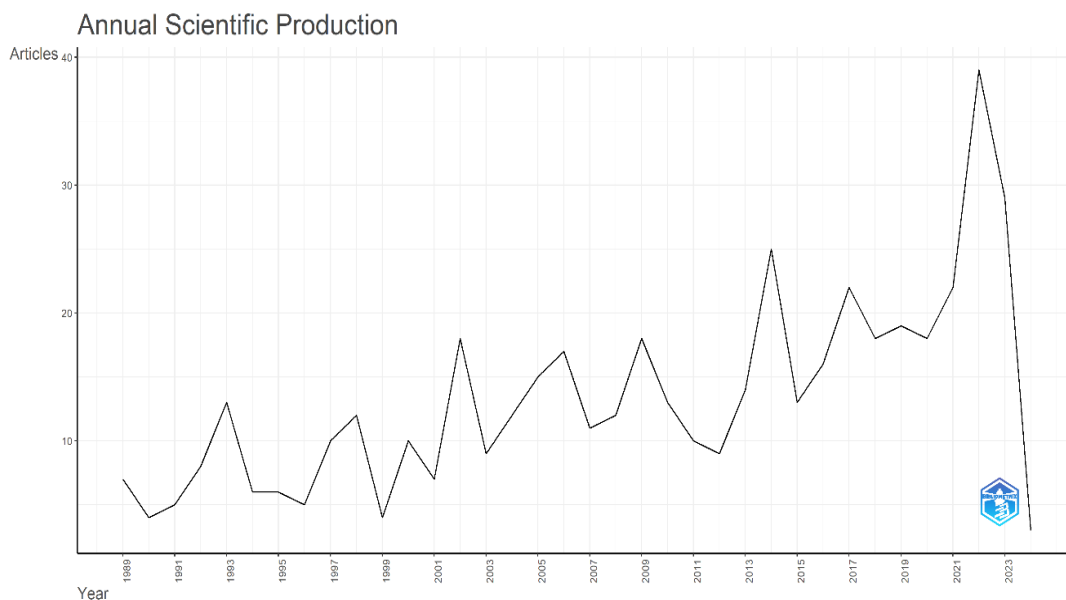


Figure 3: Annual scientific production of documents in insurance fraud topic

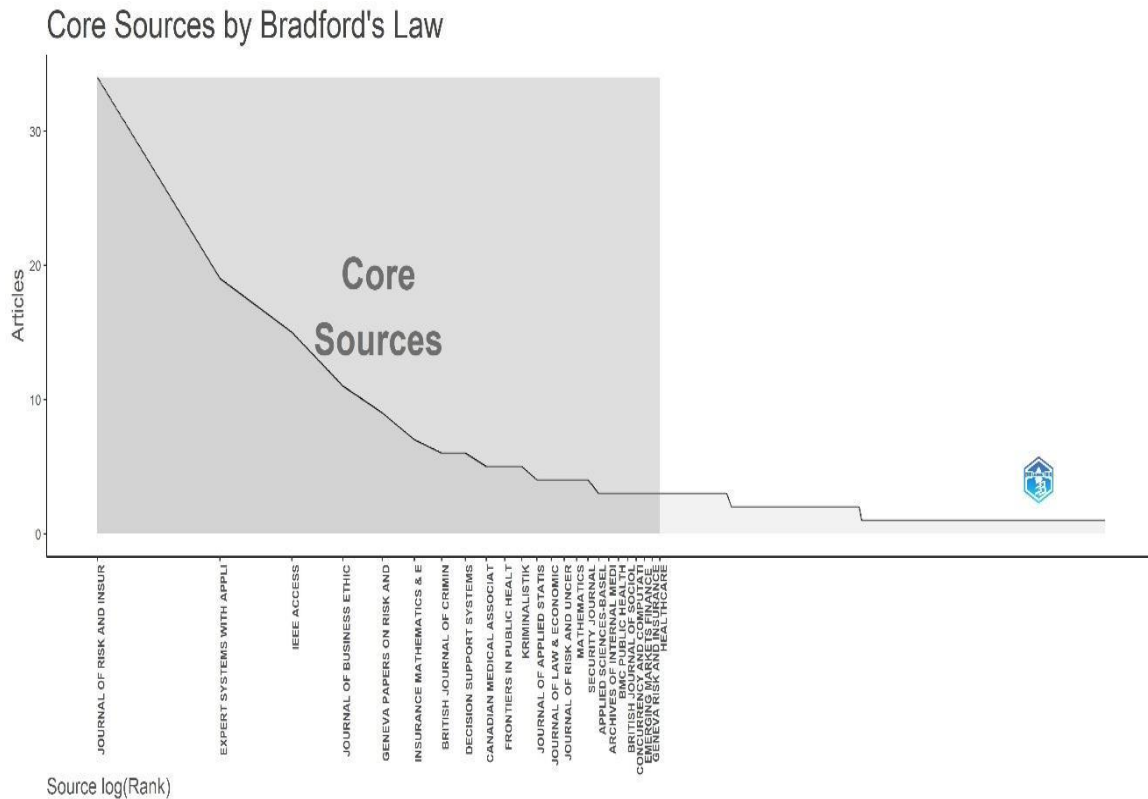


Figure 4: Bradford's law

3. RESEARCH QUESTIONS

- Qn.1. What is Insurance fraud, and briefly discuss the causes and effects?
- Qn.2. Discuss the financial turbulence due to the effect of Insurance fraud.
- Qn. 3 What are the contributions of information technology to fraud detection and prevention?
- Qn. 4 Artificial Intelligence in Reducing Insurance Fraud: A Futuristic Approach?

4. SOURCES OF DATA

The study adopted a secondary data collection strategy using previous literature studies. The secondary sources are collected through several articles limited to Scopus, Web of Science and Google Scholar. Akomea et al. (2016) obtained data from Scopus and Web of Science, whereas some articles pertained to any of the three databases. The keywords were chosen among the major concepts of the article concerning the literature reviewed. The major keywords are insurance fraud, financial implications, information technology, and artificial intelligence, as the title strives to discover AI's role in reducing insurance fraud. The keyword Insurance fraud is a criminal act which involves obtaining financial gain from an insurer or insured using misrepresentation of facts (Derrig, 2002). With the deep insight of the study, the keywords that contribute to insurance fraud were selected. From the various studies undertaken, the research

strategy follows reviewing various published articles. The articles try to enlighten the concept of insurance fraud from a holistic perspective, including its causes, effects, and also the contribution of AI in reducing insurance fraud. Table 1 shows the extract of keywords and data from the literature reviewed, the number of articles, authors and so on.

Table 1: Data descriptions

Data characteristics	Number
Timespan	1989:2024
Sources (Journals, Books, etc)	247
Documents	479
Annual Growth Rate %	-2.39
Document Average Age	13.6
Average citations per doc	17.03
References	12051
Keywords Plus (ID)	649
Author's Keywords (DE)	1008
Authors	987
Authors of single-authored docs	97
Single-authored docs	117
Co-Authors per Doc	2.72
International co-authorships %	21.92
article	399
article; early access	9
article; proceedings paper	25
book review	11
editorial material	6
letter	5
meeting abstract	9
news item	7
note	1
reprint	1
review	6

Source: Web of Science database

5. RESULTS AND DISCUSSION

Qn.1. What is Insurance fraud, and briefly discuss the causes and effects?

Insurance fraud is a current social damage which requires urgent attention to establish stability in the economic system. As a global economic problem, Insurance fraud threatens insurers' financial strength and the institution's survival (Yusuf & Babalola, 2009). It has become a serious social problem destroying the insurance ecosystem (Hoon, 2020). It is a risk associated with the insurance sector which affects the day-to-day life of individuals, organizations and society. It is a kind of fraud that intentionally causes harm to one person, organization, or society by concealing the facts to defraud insurance money (Clarke, 1989; Jun Han-Deok, 2019). The International Association of Insurance Supervisors (I.A.I.S, 2007) defines Insurance fraud as “an act of omission intended to gain a dishonest advantage by the fraudster

for other parties” (Akomea et al., 2016). Insurance fraud is a criminal act which involves obtaining financial gain from an insurer or insured using misrepresentation of facts (Derrig, 2002).

Insurance fraud represents internal and external; this classification identifies the fraud committed within or outside an insurance company (Akomea et al., 2016). Hence, the parties involved in the insurance fraud are insurers and employees (internal) and policyholders/consumers (external). Major causes relating to insurance fraud depend on the customer's attitude towards the fraudulent behavior (Cummins & Tennyson, 1996). Akomea et al. (2016) discuss the causes of Insurance fraud, including making fictitious data/information in the insurance policy, multiple contracts with companies on the same insurable item, weak internal controls, poor remuneration of employees, theft and deliberate acts of policyholders with a profit motive and inadequate training for independent brokers. The major impact of insurance fraud deals with the financial performance of the companies as it is the indicator of measuring fraud in quantifiable aspects by looking into the Return on Assets value (Anand et al., 2004; Soteriou & Zenios, 1999).

By conducting systematic literature reviews, the authors try to holistically discover the concept of insurance fraud by interconnecting the issues relating to various insurance areas. Many studies are conducted from the perspective of the parties involved in the internal insurance fraud, while some studies focus on the insurance fraud caused by the external parties only. Throughout the Systematic Literature Review, the authors discuss various aspects of Insurance fraud. It is found that limited studies were made in relation to Insurance fraud and Artificial Intelligence. Since we are in the industry revolution 4.0, the pace of rapid innovation is relevant in every segment. This reflects on the field of Insurance with the introduction of Artificial Intelligence.

Insurance fraud can be detected and prevented with the application of Big Data. Data analytics plays a significant role in extracting valuable information relating to the trends and patterns of the insurance business. Artificial Intelligence carries enormous transformational potential in the various areas of the insurance sector. The insurers use AI technology to improve customer service, to acquire tremendous growth, increase the profit and as a tool to fight against Insurance fraud (Dhieb et al., 2020; Gupta, 2020). The study proposes that Insurance fraud can also be prevented to an extreme while following ethical guidelines in the organisation, providing a positive working environment to the employees and arranging workshops, seminars and other training programs for improving the organisational commitment of the management and the employees.

Qn.2. Discuss the financial turbulence because of Insurance fraud.

Insurance fraud is growing rapidly along with the growth of the sector, which causes huge social and economic damage (Sung Tae Kyung, 2003). The damage caused by the insurance fraud reflects the smooth working of the organisation, which increases insurance premiums by losing good policyholders. It is costly for insurance companies as they have to settle the losses intentionally created by the parties involved in the crime. The parties involved in the fraud may

be internal or external. Financial malpractice should cause a bad relationship between the firm and the customer. Customers may be unwilling to deal with a management team with less integrity, lowering their demand for the firm's services (Johnson & Nagarur, 2016). Insurance fraud gives a financial advantage by falsifying the actual position (Derrig, 2002).

The major performance management indicator is the firm's financial position assessment. The most common performance indicator in the insurance industry is financial, measured by monitoring profitability levels (Soteriou & Zenios, 1999). The insurance sector is growing in the emerging digitalised economy; the fraud in the sector leads to financial turbulence in the organisation. Insurance fraud increases the premium, adversely affecting the company's financial stability and the insurance claims field (Chudgar, 2013).

The Association of Certified Fraud Examiners reveals that the majority of organizations lose 5% of their revenue annually due to fraud, translating to roughly \$3.5 trillion globally. According to the Coalition against Insurance Fraud (2015), 10% of the annual insurance losses are due to fraud. The financial performance of an insurance firm shows the result of the fraud activities by referring to the return on Assets (Cressey, 1953)

The financial impact of the insurance companies on fraud is high because the companies have to bear all the expenses for meeting the insurance claims, which the concerned parties intentionally make. From this, it is clear that the effect of insurance fraud is terrific, which urgently requires a defensive mechanism to prevent insurance fraud issues and adopt new developments using AI technology.

Qn. 3 What are the contributions of information technology to fraud detection and prevention?

Fraud is deliberate deceit or falsification of information made by a person or an organization to achieve some financial or personal gain. Moore et. al (1991) decided to focus on measuring the potential adopters' perceptions of the technology. The adoption perceptions were initially based on the five characteristics of innovations that Rogers (1983) derived from the diffusion of innovations. Blockchain technology is another innovation in the field of IT.

Blockchain is called efficient insurance transactions with real-time transparency and smart contracts. However, only a few studies focused on reducing information asymmetry in the insurance market and preventing fraud using blockchain technology. Ryu (2019) suggests that blockchain technology reduces information asymmetry in the health insurance market by enabling market participants to share medical information effectively and safely. To solve the social issue of Insurance fraud, the author describes a project aiming to specify and develop a suite of computer-based tools for supporting the early detection and subsequent investigation of potentially fraudulent claims (Ormerod et al., 2012).

Akome et al. (2016) have opined that to deter insurance fraud, effective internal fraud policy, rigorous assessment of insurance policies and claims, adequate training for independent and brokers on insurance fraud, and modern information technology tools are essential. Fraud detection and prevention can be associated with adopting privacy-preserving information-hiding techniques facilitating targeted data mining without infringing privacy restrictions. It is

proposed as a strategic tool in fighting against financial and insurance fraud (Verykios et al., 2022). The IT contributions in detecting and preventing helps to reduce fraudulent behaviour internally and externally.

Qn. 4 Artificial Intelligence in Reducing Insurance Fraud: A Futuristic Approach?

This research question is addressed using tools like the thematic map and thematic evolution. New technologies have transformed the interaction between insurers and clients depending on their adaptability to new expectations and needs. Traditionally, customers need personal interaction through agents, brokers or banks to obtain product information (Barroso & Laborda, 2022; Eling **et al.**, (2018). As a result of the digitalised economy, everything has changed, and insurance claim details are also available online for easy access and purchase for customers.

In an insurance policy, AI can automatize the adequate information from submitting documents to improve efficiency, using machine reading on the submission of documents, automated information extraction and the creation of structured data extracted for efficient processing. AI algorithms enrich statistical models for estimating loss and developing more accurate loss prediction, decreasing claim rate, frequency, and severity (Wu et al., 2023).

According to the Centre for Insurance Policy and Research (2017), artificial intelligence can allow firms to automate the tasks related to the manual process of historical data, increasing the capacity of data processing and customer service for developing new products. Thus, an efficient underwriting ecosystem can be built by adopting machine learning methods that support a better risk assessment (Xie & Yu, 2018).

AI-based chatbots, the industry's biggest amalgamation, can enhance the present claim process done by many employees while conducting claim reviews, verifying policy details and scanning the data through a fraud detection algorithm. Therefore, this application reduces human efforts from the client's side and saves the workforce for insurance companies while mitigating risks by detecting data patterns in claim reports and enhancing customer experience (Makadia M, 2019).

Jones et al. (2019) opinions on the role of AI in fraud detection and reduction as the International Business Machines Corporation (IBM), a crucial player in the innovation ecosystem worldwide, has developed Watson Assistant, a chatbot with natural language processing. When this technology joins with another A.I. competence, such as visual categorization and machine learning, it can effectively evaluate the accuracy and fair financial costs of a claim. The future of digitalization is the world of Artificial Intelligence in every sector; insurance companies have started transforming to the new era very efficiently by adopting Insurance fraud detection techniques using Artificial Intelligence.

5.1 Thematic mapping of Insurance frauds

The thematic map shows four quadrants: Motor, niche, basic and emerging themes. Motor themes show highly developed and relevant themes on which the authors work (Biju et al., 2023). We can see fraud detection, usage of machine learning, reduction of health insurance fraud risk, data mining, automobile insurance fraud, etc., finding spaces in the motor themes.

In the thematic quadrant, the niche theme depicts the most developed concepts under insurance fraud. Here, we find epidemiology, motor vehicle accident claims, aggregate claim models and claim severity in the niche theme. The basic themes show highly relevant themes but are not developed much and have scope for development later.

Moral hazards, asymmetric information, and adverse selection are basic themes that forecast future development. The emerging themes show a future research agenda in areas like the hierarchical Bayesian model, bonus-malus system, etc., which form the emerging areas that need academicians' attention.

The details of the thematic map are shown in Figure 4. Figure 6 ultimately shows us that the role of technology like blockchain and artificial intelligence in preventing insurance fraud is the recent acceleration in academics and academicians involving these focal points while researching insurance frauds. Figures 5 and 6 show the reflections of mapping using a thematic map and the evolution of literature.



Figure 5: Thematic mapping of insurance frauds

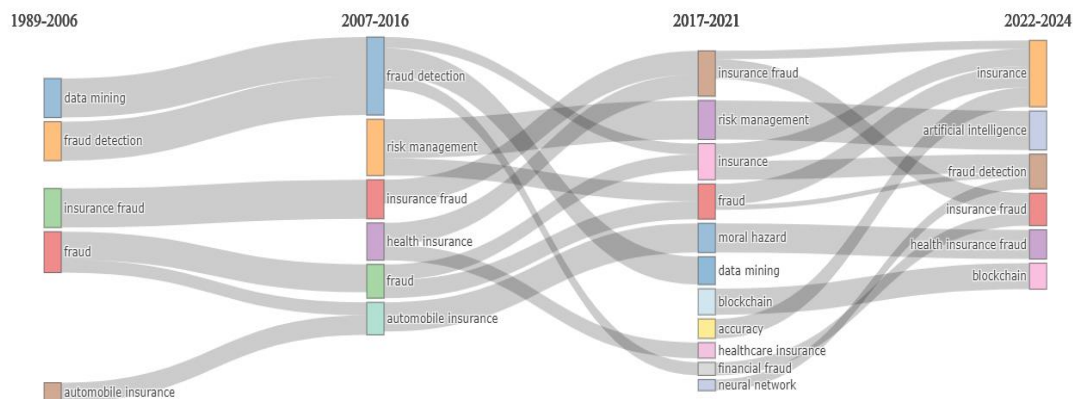


Figure 6: Thematic Evolution

6. CONCLUSION

In today's competitive world, Insurance fraud is a challenge confronting the Insurance industry. Through a systematic review, this article discusses various aspects of insurance fraud, from its causes, types, and detection to how to prevent this social and economic evil using Artificial Intelligence, an emerging trend in the IT field. The investigation finds various perspectives on insurance fraud. Nevertheless, few studies deal with insurance fraud and its implications in information technology and artificial intelligence.

The systematic reviews play a key role in assimilating existing and contributing new perspectives of the concept. Here, the authors tried to discuss insurance fraud from a holistic perspective by considering today's companies' concerns related to the same. Artificial intelligence provides claims management solutions through process automatization and fraud detection by adopting machine learning techniques and other AI tools to recognise fraudulent claims better. It is also found that in the success of digitalization, a crucial role of employees throughout the process is mandatory, thus innovating the organisation's culture.

The authors focus on Systematic Literature (SLR) confined to the reasons insurance fraud happened in various segments, the parties involved in it, and its consequences, and also to take preventive measures by adopting AI technology to reduce insurance fraud. The paper focuses on creating an outlook of Insurance fraud from a holistic perspective by interconnecting the issues relating to various insurance areas. The emerging themes show a future research agenda in areas like the hierarchical Bayesian model, bonus-malus system, etc., which act as emerging areas that need academicians' attention.

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