

Blockchain technology for Fraud Detection and Risk Prevention in Insurance Industry

Inayatulloh

Information Systems Department
School of Information system
Bina Nusantara University
Jakarta, Indonesia 11480
Inay@binus.ac.id

Siti Elda Hiererra

Information Systems Department
School of Information system
Bina Nusantara University
Jakarta, Indonesia 11480
elda.siti@binus.ac.id

Prasetya Cahya S

Information Systems Department
School of Information system
Bina Nusantara University
Jakarta, Indonesia 11480
prasetyacs@binus.ac.id

Rozali Toyib

Universitas Muhammadiyah
Bengkulu, Indonesia
rozalitoiyib@umb.ac.id

Nico Djundharto Djajasinga

Politeknik Transportasi Darat Indonesia-STTD
nico.djajasinga@ptdisttd.ac.id

Sawqi Saad El Hasan

Sekolah Tinggi Ekonomi Bisnis Islam Syari'ah Bina Mandiri.
sawqi@binamandiri.ac.id

Rofiq Noorman Haryadi

Sekolah Tinggi Ekonomi Bisnis Islam Syariah Bina Mandiri
Bogor, Indonesia 11480
rofiq@binamandiri.ac.id

Rivaldhy N. Muhammad

Study Program of Law, Faculty of Law, Social and Political Sciences
Open University, Indonesia
valdhymuhammad1@gmail.com

Abstract

The insurance industry is a collection of service companies that provide protection services to customers with agreements and agreements from several parties involved. The conventional mechanism of the insurance claim process has the potential to cause fraud and a high risk that will harm the parties involved. On the other hand, block chain is a technology that one of its features is to provide a ledger where insurance companies can transfer insurance claims to an immutable ledger and help eliminate sources of fraud that are common in the insurance industry. The aim of this research is to help reduce fraud and risk for the insurance industry in general. The research method uses a qualitative approach through observation of the mechanisms and business processes in insurance companies, especially those related to the claim process, to identify existing problems. Literature studies are used to find alternative solutions with information technology. The result of this research is a block chain model to reduce fraud and risk for the insurance industry in general.

Keywords

Block Chain Technology, Insurance, Fraud, Ledger.

1. Introduction

Insurance is an agreement between the insurance company and the policy holder which forms the basis for receiving premiums by the insurance company in return for providing compensation to the insured or policy holder due to losses, damages, costs incurred, lost profits, or legal liability to third parties that may be suffered. the insured or the policy holder due to the occurrence of an uncertain event; or provide payments based on the death or life of the insured with benefits whose amount has been determined and/or based on the results of fund management. Insurance business is a business activity engaged in: Insurance or risk management services, Risk reinsurance, Marketing and distribution of insurance products or sharia insurance products, Insurance consulting and intermediary, sharia insurance, reinsurance, or sharia reinsurance, or Insurance or insurance loss appraisers' sharia. Insurance business is carried out by General Insurance Companies, Life Insurance Companies, and Reinsurance Companies (Hudson et al. 2019) (Ciarapica et al. 2019) (Ghony and Emy 2021) (Hemrit 2022) (Upreti et al. 2021) (Gonzalez and Jeronia 2022).

Insurance fraud is any act committed to defraud an insurance process. It occurs when a claimant attempts to obtain some benefit or advantage they are not entitled to, or when an insurer knowingly denies some benefit that is due (Macedo et al. 2021) (Rukhsar et al. 2022) (Zourrig and Jeongsoo 2019).

Block chain can eliminate the potential for fraud insurance with its superior features. The purpose of this research is to help eliminate insurance fraud for insurance companies and all parties involved in the insurance process. The research method uses a qualitative approach through observation to insurance companies to study business processes, especially insurance claim mechanisms. Literature studies are used to find alternative solutions using information technology and determine the technology block chain as a solution. The result of this research is a blockchain model for insurance companies in general to eliminate potential insurance fraud.

2. Literature Review

Fraud Insurance

Insurance fraud is any act committed to defraud an insurance process. It occurs when a claimant attempts to obtain some benefit or advantage they are not entitled to, or when an insurer knowingly denies some benefit that is due. The most common schemes include premium diversion, fee churning, asset diversion, and workers compensation fraud. Perpetrators in the schemes can be insurance company employees or claimants (Zorrig et al. 2018) (Ghorbani and Sara 2018) (Tar 2019).

False insurance claims are insurance claims filed with the fraudulent intention towards an insurance provider. Insurance fraud has existed since the beginning of insurance as a commercial enterprise (Kahraman and Ipek 2019) . Fraudulent claims account for a significant portion of all claims received by insurers, and cost billions of dollars annually. Types of insurance fraud are diverse and occur in all areas of insurance. Insurance crimes also range in severity, from slightly exaggerating claims to deliberately causing accidents or damage. Fraudulent activities affect the lives of innocent people, both directly through accidental or intentional injury or damage, and indirectly by the

crimes leading to higher insurance premiums. Insurance fraud poses a significant problem, and governments and other organizations try to deter such activity (Riberio et al. 2020) (Bhamidipati et la. 2021) (Tar 2019)..

Insurance Fraud, the causes vary, but are usually centered on greed, and on holes in the protections against fraud.[4] Often, those who commit insurance fraud view it as a low-risk, lucrative enterprise. For example, drug dealers who have entered insurance fraud [5] think it's safer and more profitable than working street corners (Roy and Sreeleaka 2022). Compared to those for other crimes, court sentences for insurance fraud can be lenient, reducing the risk of extended punishment. Though insurers fight fraud, some pay suspicious claims anyway, as settling such claims is often cheaper than legal action (Bambauer Andrea 2021).

Another basis for fraud is over-insurance, in which someone insures property for more than its real value.[2] This condition can be difficult to avoid, especially since an insurance provider might sometimes encourage it to obtain greater profits.[2] This lets fraudsters profit by destroying their property, because they receive an insurance payout greater than the value of the property. The most common forms of insurance fraud are re-framing a non-insured damage to make it an event covered by insurance and inflating the value of the loss. Figure 1 show the mechanism of insurance claim (Steinberg 2021) (Davey 2020).

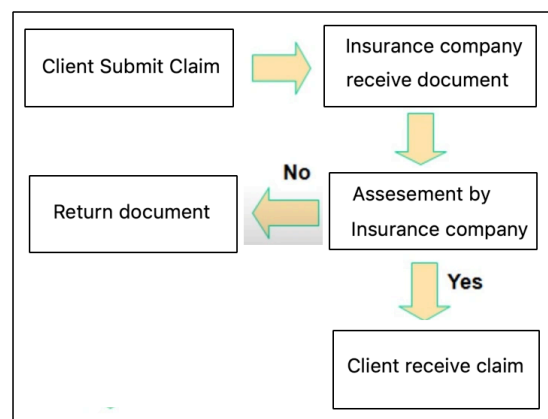


Figure 1. Claim Insurance Mechanism

Block Chain

Information and communication technology has been used in many fields, such that in learning (Ramadhan et al. 2022) and government (Ramadhan et al. 2013). One of the the emerging technology is blockchain technology. Blockchain is a data structure that cannot be changed, it can only be added. Every data from the Blockchain is interconnected where if there is a change in one of the data blocks it will affect the next data. Blockchain technology appears to revolutionize more modern financial technology with a more instant, transparent, and efficient work system without the need to rely on a centralized server. With Blockchain, every transaction is stored in an Open Ledger (Ledger) which is distributed in the block chain network. Each Blockchain will share a copy of the data to every computer connected to the network. At each addition of data there will be a check whether the data is valid or not, this process is usually called mining or known in other terms Proof of work (Yen et al. 2021) (Shina and Shuvo 2021) (Xu et al. 2022).

Some of the working principles of Blockchain that need to be known are Distributed Databases. Every party that joins the Blockchain has access to all data and complete transaction history without exception. It is a pure form of transparency and adopts a decentralized database system. Each party can verify their partner's transactions directly without a middleman (Xu et al. 2019).

The second block chain has the principle of Peer-to-Peer Transmission. Communication or transactions occur between one party to another without going through an intermediary node. Each node can store and pass information to other nodes. Each node or user in the Blockchain has an address containing 30 or more alphanumeric characters for user

identification (such as username id). Users can choose to keep their real names hidden or reveal them when making transactions (Wibowo and Tesar 2019) (Gupta et al. 2020).

Block chains also have an irreversible record. If the transaction has been recorded in the database, the record cannot be changed because the Blockchain system has a security system called cryptography. This system is equipped with various algorithms that make all transactions arranged in chronological order and accessible to all. If you want to change the data of one transaction, then all data must be erased and start all over (Sadiku et al. 2018) (Liucheng 2018) (Huang et al. 2019).

3. Methods

Figure 2 describes the research method. An insurance claim is a claim from the insured party due to a contract agreement with the insurance party to guarantee the payment of compensation as long as the premium payment has been made by the insured party. This process has the potential for fraud to occur and this problem is the initiation of research. The research is continued by analyzing the claim submission mechanism to identify the stages that are the root of the problem. After knowing the problems in the claim submission process that have the potential to cause fraud, the research is continued with a literature review to find alternative solutions with an information technology approach. Based on the results of the literature review, blockchain technology is a solution to solve the problem of insurance claim fraud. The final stage of this research is to build a blockchain technology model to protect the insurance industry in general from fraud.

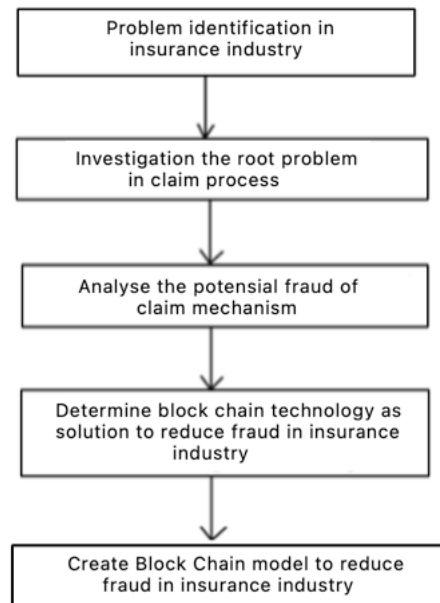


Figure 2. Research Method

1. Results and Discussion

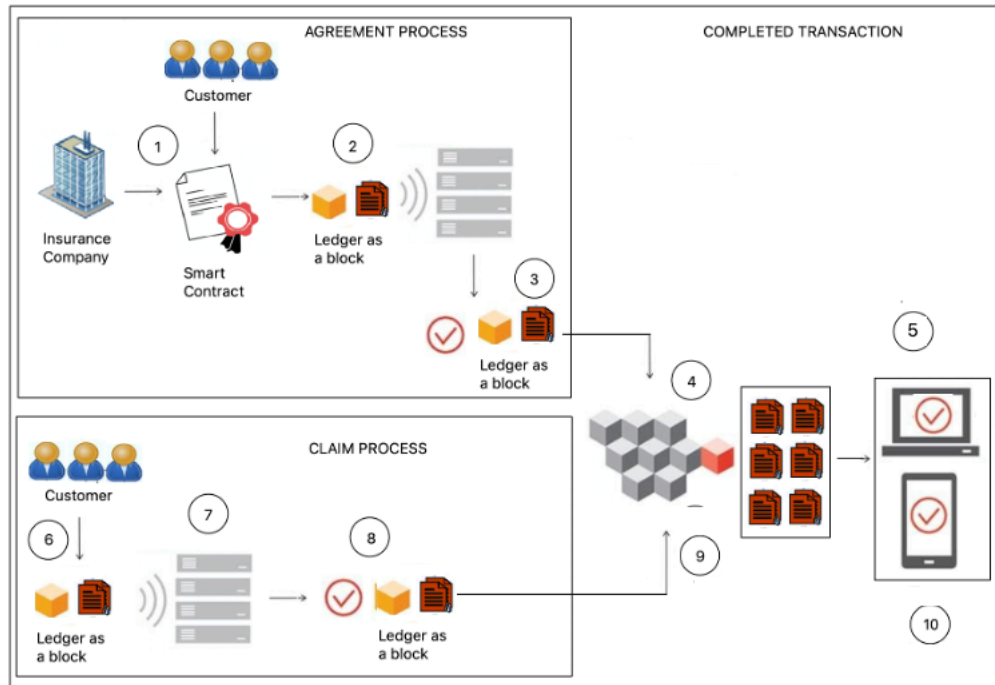


Figure 3. Proposed Model

Figure 3 illustrates the model offered. The model consists of 3 main components which are the sequence of submitting claims from customers to insurance companies. The number in the picture has the following explanation:

1. The initial process when a customer registers as an insurance participant where there is an agreement between the customer or insurance customer whose agreement is stored in a smart contract. The smart contract will become a new ledger/block that will be distributed into the block chain network.
2. The block / ledger will be broadcast into the block chain network and the system will validate the new block
3. The validation process is carried out at each node on the block chain network. In the context of this research, all ledger data as blocks will be stored in all nodes on the block chain network. This is where the advantage of the block chain is where data will be difficult to manipulate.
4. After the data is validated in all block chain networks, the new block will become part of the block chain network
2. Submitting the customer as an insurance company customer is completed and the customer can access approval via smartphone or PC.
3. When the customer will submit a claim, the claim submission will create a new block in the form of a ledger.
4. Claim submissions will be broadcast to all block chain networks
5. Each node on the blockchain network will validate the claim submission from the customer in question and in this process the potential for fraud when submitting a claim will be lost
6. If the validation process is successful, the customer's claim becomes part of the block chain network.
7. Customers who submit claims can find out the results of submitting claims via smartphone or PC.

6. Conclusion

Fraud in the insurance industry is a classic problem that is difficult to avoid because there is potential for fraud in conventional claim mechanisms. The adoption of blockchain in the insurance industry is the best solution because it

offers a mechanism that covers all opportunities for fraud. On the other hand, blockchain-based information technology supports an integrated claim submission mechanism so as to create an effective and efficient system.

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Biographies

Inayatulloh SE.MMSI,CDMS.CSCA is a lecturer at Bina Nusantara University, School of Information System Jakarta Indonesia and also a doctoral candidate of computer science, experienced in managing systems in the retail, automotive, convection and education industries. research domain in e-learning, e-business, e-commerce, cloud computing, IoT and block chain technology.

Ade Fadli Fachrul, Master of Communication & Property Management. He had experience working as lecturer at Sekolah Tinggi Ilmu Dakwah Dirosah Islamiyah Al Hikmah (STIDDI AL HIKMAH) Jakarta. He graduated from Bachelor Degree in Nasional University, Jakarta, Master Degree in Universiti Teknologi Malaysia and Mercu Buana University, Jakarta. He has been more than 20 years of lecturer experiences.

Rozali Toyib is a lecturer at the University of Muhammadiyah Bengkulu in the Faculty of Engineering, various activities have been carried out such as seminars in the IT sector, Applied Research in the IT field, IT workshops and is active in various professional organizations as an administrator of the Bengkulu Branch of the Indonesian Informatics Expert Association (IAII), Assistant for the Program Centre of Excellence Vocational High School (SMK-PK) and is active as a coach for student affairs in student creativity programs.

Prasetya Cahya S is a Faculty Member at Bina Nusantara University as well as a practitioner and technopreneur in the field of information systems. He is an alumni of the University of Indonesia Master of Information Technology program and has more than 25 years of experience both as a lecturer at several universities and also a consultant for several IT projects such as the State Gas Company, the Indonesia Stock Exchange, Bank Indonesia and also the World Bank.

Rofiq Noorman Haryadi, he was born in Bandung, November 30, 1983. After graduated from Indraprasta PGRI University in 2016, he continued to study to get Magister Education in 2018 in the same university. Recently, as a lecturer in STEBIS Bina Mandiri Cileungsi, Indonesia at Management Business Sharia Program study with a focus on a course of English Education.

Rivaldhy N. Muhammad is a Lecturer at the Open University which is one of the State Universities in Indonesia. holds a Bachelor of Laws degree at Khairun University Ternate and a Masters degree at Janabadra University Yogyakarta. Since becoming a Lecturer in 2018, he has been assigned to Jayapura Papua Open University as a Lecturer

in the field of Legal Studies who always provides teaching and guidance to students who need good knowledge. Before becoming a lecturer, Rivaldhy N. Muhammad was a lawyer who always helped people who needed legal aid services.

Dr. Ir. Nico Djundharto Djajasinga, MSc. CPFF. IPM is a lecturer and head of the Applied Masters Study Program at the Indonesian Land Transportation Polytechnic-STTD and has competence as an examiner of railroad buildings, inspector of railway infrastructure, railway auditor and assessor of railway HR and also has expertise in the field of land transportation engineering, especially railways, service management and logistics, as well as safety and risk