

Smart Contract and Hash Function for Property Insurance with Blockchain Technology to Improve Claim Process Efficiency

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Abstract

Property insurance is an insurance product that provides compensation in the event of damage to the insured property. The property covered includes houses, office buildings, and others. This problem becomes an obstacle to the claim realization process so that a mechanism is needed that can improve the efficiency of the claim process. Blockchain technology can be a solution to this problem because blockchain technology has smart contract and auto validation features that can speed up the process of submitting property insurance claims. Thus, the purpose of this research is to improve the efficiency of the property insurance customer claim submission process using block chain technology. The research method uses a qualitative approach through observation in insurance companies, especially property insurance to identify problems, especially problems related to the claim process. To determine alternative solutions using a literature study that focuses on information technology-based solutions.

Keywords

Block Chain Technology, Property Insurance, Claim Process.

1. Introduction

Insurance is an agreement between two parties, namely the insurance company and the policy holder, which is the basis for receiving premiums by the insurance company in return for providing compensation to the insured or policy holder due to loss, damage, costs incurred, lost profits, or legal liability to the insured. third parties that may be suffered by the insured or the policyholder due to the occurrence of an uncertain event or provide payments based on the death of the insured or payments based on the life of the insured with benefits whose amount has been determined and/or based on the results of fund management (Santri et al. 2022) (Paramudhita et al. 2022) (Nurochim 2021).

Property insurance is a type of protection or protection against property assets such as houses, apartments, and offices. The main purpose of using this type of insurance is to anticipate financial losses caused by unwanted events that befall the property (Fobazzi et al. 2020) (Porter et al. 2019) (Charpentier et al. 2022).

Problems experienced by the Property Insurance party such as the claims submitted are not in accordance with the contents of the insurance policy. The insurance agreement must be made in writing in the form of a deed called a "policy" which contains an agreement, special terms and special promises that form the basis for fulfilling the rights and obligations of the parties (the insurer and the insured) in achieving the insurance objectives. Thus, if you want to make a claim, of course it must be in accordance with the policy in the insurance agreement. However, many customers submit claims that are not in accordance with the contents of the policy (Romanoskky et al 2019).

The second problem related to the insurance claim process is the delay in filing. Coverage is usually held for a certain period of time. This period must be explained in the policy. Apart from that, there is another coverage that applies based on a travel grace period, so if the trip ends or the insured item has arrived at its destination, the coverage ends. However, many customers who submit claims are not in accordance with the specified time (Oham et al. 2018).

The third problem related to filing a claim is the lack of documents and errors. The insurance agreement stipulates that the policy must also state the location and limits of the insured property, its use, the nature and use of adjacent buildings, as long as this may have an effect on the insured, the value of the insured item, the location and boundaries of the building and the place of residence. , where the insured movable property is located, stored or stacked(Michelon et al. 2019) (Joffe et al. 2019)

The purpose of this research is to help insurance companies solve the problems described above by using smart contracts that are integrated with block chain technology. The result of this research is a model that is added with a hash function feature to improve data security. The research method uses a qualitative approach through observation

to identify problems in property insurance, especially those related to the claim process. Alternative solutions are designed through literature studies that focus on information technology-based solutions.

2. Literature Review

Insurance

Insurance is a form of agreement between the insured and the insurer (Meiri et al. 2020) (Prymostka 2018) (Trusova et al. 2020). The insured will have to pay dues to the insurer. The goal is to obtain compensation for financial risks that may occur. The insurer is an insurance company. Meanwhile, the insured is the customer or the owner of the insurance (Fonta et al. 2018) (Jiang et al. 2021) (Brobeg 2020).

There are 3 main elements in it, namely policies, premiums, and insurance claims. The policy is a document that states the agreement between the two parties. The contents are in the form of benefits, premium amount, risks, and so on. Meanwhile, premiums are contributions that customers have to pay within the agreed period. A claim is a formal submission to an insurance company when a risk occurs. The terms of any risk that can be covered have been written in the policy. So, if a disaster is included in the agreement, then you can rely on insurance to lighten the burden.

Property insurance

Property insurance will provide various types of protection against the risk of property loss. These risks include the risk of fire, theft with violence (thief), riots and riots, legal liability to third parties, costs of architects/surveyors and consultants, even damage caused by being hit by a vehicle. insurance (Kousky 2019) (Palm et al. 2019) (Grzegorzczuk 2020). Figure 1 show the conventional mechanism of claim in property. (Figure 1)

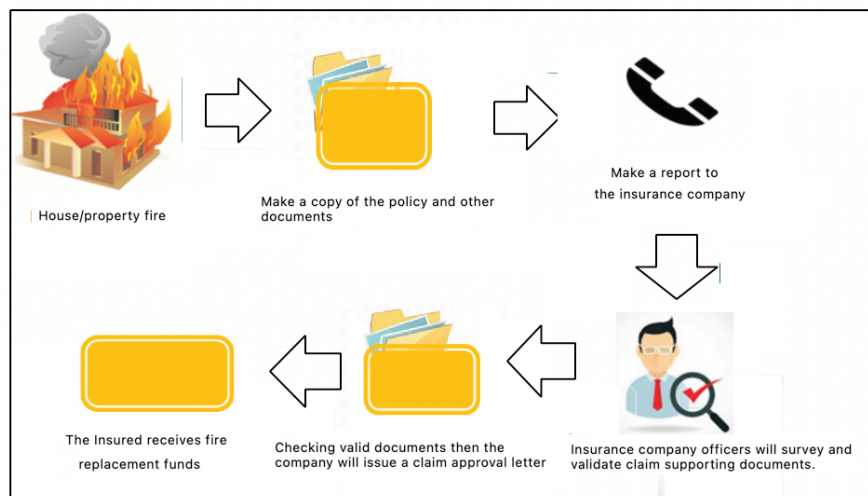


Figure 1. Claim mechanism of property insurance

Smart Contract

A smart contract is an automatic contract where the terms of the transaction agreement between the buyer and seller are directly entered into the code line (Chen et al. 2021) (Sahai and Rajiv 2020) (Amani et al. 2018). This code will be stored in every node on the entire blockchain network. With the existence of a smart contract, every transaction with blockchain technology will be fully controlled in a transparent manner. What's more, the code is decentralized and distributed on the network. This allows nodes/participants to track every transaction easily and get maximum security. All transaction parties, including the sender and recipient, can exchange without requiring a central authority (Ozylimaz et al. 2019) (Gatteschi et al. 2018) (Wang et al. 2018). Smart contracts operate transparently so that users have a high level of trust. Smart contracts also have high accuracy due to process automation and guaranteed data security due to a decentralized system

Block chain

Various kinds of technological developments have been used in various sectors, for example in the government sector (Ramadhan et al. 2021), education (Ramadhan et al. 2022), including business (Noprisson et al. 2016). Blockchain is a new technology developed for digital data storage systems. This technology is connected through cryptography and its use cannot be separated from Bitcoin and other cryptocurrencies. Blockchain starts when a block receives new information (Vivenkanadam 2020) (Inayatulloh 2021) (Bhushan et al. 2021)

The blockchain system consists of transactions and blocks containing a series of cryptographic hashes and previous block hashes to form a network. Blockchain works by recording immutable information. The decentralized nature of blockchain means that this technology does not need to rely on external authorities for validation and integrity of data authenticity. This process is a decentralized process that usually occurs between network nodes to ensure the information is valid. After the decentralization process, the data will be added into a new block. Each block contains a unique hash or code (Velmurugadas et al 2021) (Inayatulloh 2022) (Zhai et al, 2019).

Although the average blockchain transaction is an investment, the fact is that blockchain can store various types of information in the same block. Of all the advantages and benefits that this technology provides, most of its use is for financial purposes, especially cryptocurrencies. The use of this technology is considered much safer and more efficient (Gatteschi et al. 2018) (Inayatulloh 2021) (Kimani et al. 2020).

3. Methods

Figure 2 describes the research method. The conventional property insurance claim mechanism must go through several important and crucial stages that will affect the approval or rejection of a claim. The manual claim process creates an ineffective mechanism and creates opportunities for manipulation of information and documents that will hinder the claim process. After finding the potential for manipulation, the research continues by identifying alternative solutions that will improve the claim mechanism and close all opportunities for manipulation of information and activities during the claim process. The final stage of the research is to build a model of the property insurance claim mechanism by using smart contracts and integrating it with blockchain technology.

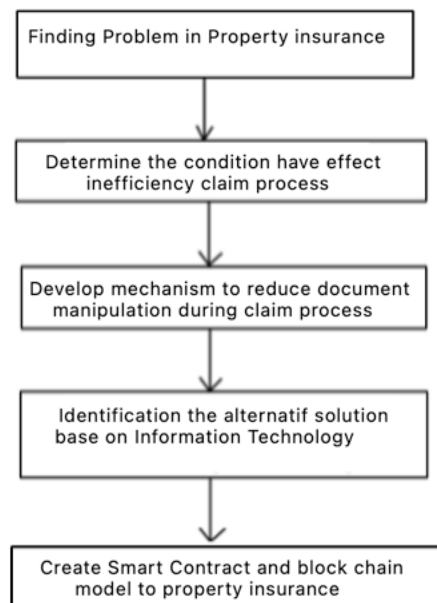


Figure 2. Research Method

4. Results and Discussion

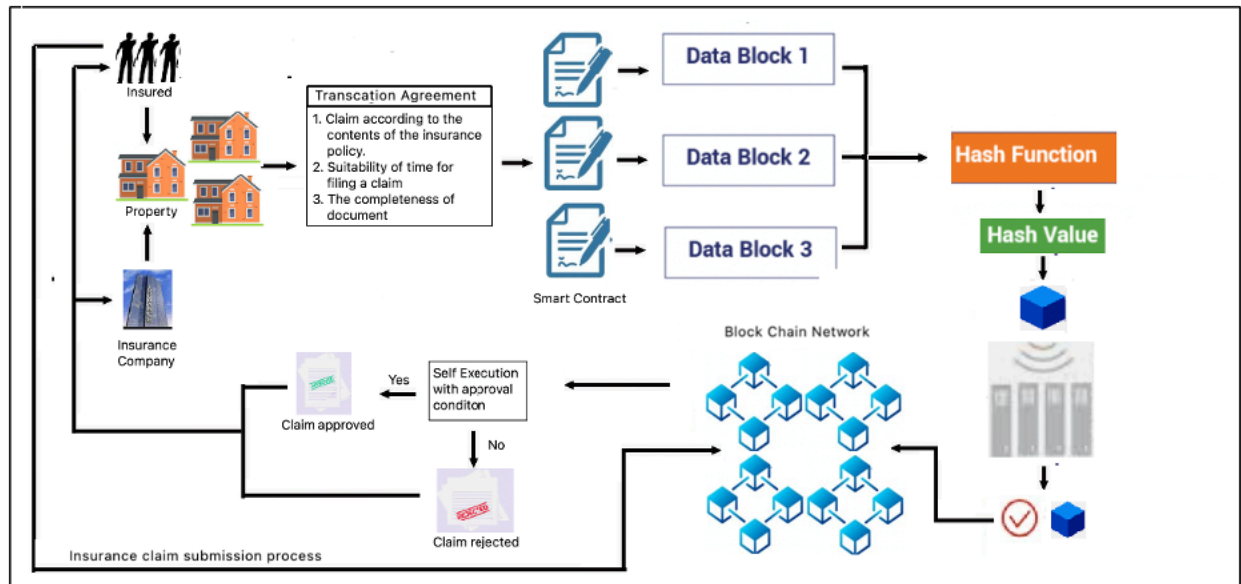


Figure 3. Proposed Model

Figure 3 illustrates the model offered. The initial part of the model describes transactions between insurance customers and insurance companies and insured property objects. Insurance customers and insurance companies make a transaction agreement with several agreement clauses. This agreement is created into a smart contract. Each smart contract will be a block that will be a candidate part of the block chain. Each block that represents a smart contract will go through a hash function and will generate a hash value to protect data security. Each block that has been encrypted with a hash function will be broadcast to the entire blockchain network. Each node in the block chain network will validate the new block and if it is valid then the new block will become part of the existing block chain network.

5. Conclusion

The conventional claim process has the potential to create manipulation that will hinder the claim submission process. Document inspection which is an important part that determines the approval or rejection of an insurance claim submission where the inspection process is carried out manually hampering the overall claim submission process. The adoption of blockchain with smart contracts in property insurance that focuses on the claim submission process is very important to increase the effectiveness of the claim approval process. The immutable, decentralized, data encryption block chain concept closes all opportunities for claim submission manipulation.

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