HIGH LEVEL DESIGN

Blockchain based Insurance system

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ABSTRACT

The project aims at leveraging the blockchain technology in the insurance industry to increase the security of transactions taking place in the industry typically settling claims, premium payment etc., and thereby increasing trust among the parties involved. The main use case identified has been to curb fraudulent transactions and minimize risk while at the same time reducing the administrative cost plaguing the industry.

This use case has been implemented using python programming language and Postman application. The algorithm includes creation and connection of three nodes (peers) establishing P2P network in which we embed the transaction details of the customer in an immutable digital ledger.

1. INTRODUCTION

Term insurance is the simplest and purest form of life insurance that provides coverage for a certain period of time or a specified "term" of years. If the insured dies during the time period specified in the policy and the policy is active, or in force, a death benefit will be paid.

A Blockchain is essentially a record, or ledger, of digital events, that is distributed or shared between many different parties. It can only be updated by consensus of a majority of participants in the system. And, once entered, information can never be erased. The blockchain consists of verifiable records for each transaction made in the system. In a blockchain system, an event is created and each time a change is made to the event, a new block is created with timestamps. Every transaction is securely linked to all the data related to the transaction

Given the potential of this technology to drive simplicity and efficiency through the establishment of highest security and immutability, it is rapidly gathering momentum withing several domains, especially finance, insurance and healthcare, where secure data is of utmost priority.

2. PROBLEM STATEMENT

Information is an insurance company's lifeblood. Properly acquiring, processing, sharing, securing, and using that information to make decisions in a timely manner is crucial—but some of today's transactions may take days (or weeks) to locate and process. Many insurers are using claims systems that were originally built more than 30 years ago. Maintaining these outdated technologies increases costs for insurers and may hamper their efforts to adopt new value-based payment strategies that will change the way insurers approach network development, provider contracting, and payments. Also, the imperative for insurers to cost-effectively maintain their administrative infrastructure is becoming more public and important.

3. PROPOSED DESIGN

The customer (insured) can use the insurer's web portal to register a new policy giving basic details like:

- ID Proof
- Insurance amount
- Premium/terms
- Maturity period or Term end
- Policy nominee ID Proof

This will initiate creation of a blockchain with these transaction details in the genesis block.

Payment of each premium will create a new block with premium amount and timestamp.

Maturity period or Term end will enable Nominee to raise a claim with following details:

- Claim Reason: demise or illness
- Death/Medical Certificate details

This will initiate a block with claim details and verification of claim will be done across the network and the hospital database/blockchain.

Claim disbursement will be the final block created where the Insurance amount is paid out to the nominee and the blockchain is terminated.

In case of claim not being verified, final block will be created with reason of declination.

4. Technical Requirements

Technology Stack for Blockchain

There are different components in the technology stack :

- The Internet is the foundational technology layer. It is a network of networks of global interconnected devices (computers, smartphones, IoT (Internet of things) devices, etc) that relies on the Internet Protocol Suite (TCP/IP) that defines how data should be packetized, addressed, transmitted, routed, and received.
- The blockchain protocol operates on the Internet through a peer-to-peer network of computing devices (the nodes) that execute the protocol, completing transactions based on a cryptographic consensus algorithm on identical copies of the distributed ledger of these transactions hosted on this P2P network of devices.

  Smart contracts — applications that run as programmed on a P2P network that is not subject to fraud, interference, or downtime.

- The underlying technology layers in the blockchain technology stack have supported the development of applications that we use in our day-to-day activities. Python is used as the programming language to implement the blockchain here

- The program runs the API on the user's localhost on port 5000. After the download and successful execution of the program, the user must have a way to make POST or GET requests to their API or another node's API for which we use the Postman API tool

- Although the current scope does not include a database and uses json and other data formats, Mongo DB or other databases can be used to store customer and policy details.

5. CONCLUSION

The main challenge faced in implementing blockchain technology is the lack of awareness of the technology itself. Each industry ends up having several blockchains created by several companies with lack of standardization. This defeats the purpose of using distributed ledgers.

In our current scope, the benefit of implementing blockchain technology extends to preventing fraudulent transactions in the case of term insurance. Blockchain technology could also be implemented by the government body in the issuance of birth-death certificate and to support tax database. This creates a link between the insurer, insuree and the government entity infrastructure and eradicates the need for excess paperwork and discrepancies.

With blockchain, the efficiency of data exchange can be significantly improved. Smart contracts can also further reduce human intervention in terms of claim settlement, indemnity payment, etc. which will significantly reduce the insurance companies' operating costs.

Smart contracts- and blockchain-based payments could enable new revenue sources, such as micro- and pay-per-use insurances. Though in the past micro-insurances were threatened by administrative costs, the exploitation of smart contracts could enable quick and cheap policy undersignment and management.