iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** V **Month of publication:** May 2020

DOI: http://doi.org/10.22214/ijraset.2020.5048

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

Decentralized Insurance Application using Blockchain

Gowtham S[1], Amos Paul S S[2], Dr. Vinoth Kumar S[3]
[3]*Assistant Professor,* [1, 2]*Department of Computer Science and Engineering, SNS College of Technology, Coimbatore, India*

Abstract: ***The blockchain emerges as a tool that potentially impacts the way we design sort of applications today. The insurance industry is heavily enthusiastic to multiple processes between transacting parties for initiating, maintaining and shutting diverse quite policies. These process are heavily hooked in to each other for proceeding the appliance to subsequent level and requires many time in processing the applications manually to approve those applications.***
These delayed processes may delay the insurer from funded with insurance amount. Transaction log for these quite transactions got to be maintained to detect fraud wiped out the sector of Insurance and process that are followed.
A Distributed Decentralized application using blockchain and Hyperledger Fabric could also be a feasible solution for addressing all the issues and may act as a platform for seamless approval of insurance applications using smart contracts or Chain codes which makes tasks easier and may completed within short span of your time.
Keywords*: *Blockchain, Chain code, Decentralized Application (DAPP), Distributed Networks, Hyperledger Fabric, Smart Contracts

I. INTRODUCTION

Blockchain is simple. If we are able to store data in blocks then its Blockchain, as simple as that. When Blockchain is introduced to the world with invention of cryptocurrency, its rapid growth is observed in every field. Due to its rapid growth, it has covered the attention of worlds tech giants.

In Insurance process, to extend the trust in processing claim, smart contract are often implemented to validate the web transaction processing. Immutability of the ledger is that the best advantage of using blockchain to prevents any kind of fraudulent transactions if the requests or actions don't conform to the principles of the contracts.

The paper targets on the planning of a strong access for processing insurance associated transactions supported a blockchain-enabled platform. The generic insurance systems require manual interactions across different transaction processes, hence leading to slow processing, and lengthy payment settlement time.

Thanks to similar issues, the insurance industry is additionally facing the challenges of detecting claim frauds, which may rather be handled most efficiently using blockchain-enabled smart contracts. Also Blockchain provide a peer to peer network. This characteristic of blockchain allow the transactions to involve only two parties, the sender and the receiver. Thus it removes the requirement of 'third party authorization'.

II. USE CASES

The need for solution for the insurance organization in blockchain domain is — (1) to ease the business processes within the insurance organization, from registering the client to making insurance offers, making claims and processing claims, (2) to form fraud-detection easier using decentralized digital repository, (3) to form client data confidential and accessible only to the authorized parties, (4) to scale back administrative and operational costs, and (5) to enable regulators and auditors to detect suspicious transaction patterns and market behaviours.

III. PROPOSED MODEL

The proposed model will implement smart contracts which will validate the materials which are the primary needs for processing the insurance claims. These contracts are installed on the network which will be shared by insurance company and their clients.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

A. Primary Entities of the Model

The primary entities of the model are the real world actors who are involved to make the company. Since the application is implemented through blockchain, secured risk analysis can be performed. This is often achieved because the policyholders carry their data between insurers meaning the policyholders bring their data to the insurer. There are two participants within the system: Policyholders and Insurers. The policyholders of the system want to try to the following: Add assets, Accept/deny insurance offers, Make claims. The insurers want to be ready to perform the following: View assets hospitable insurance, Make insurance offers, Approve/deny claims.

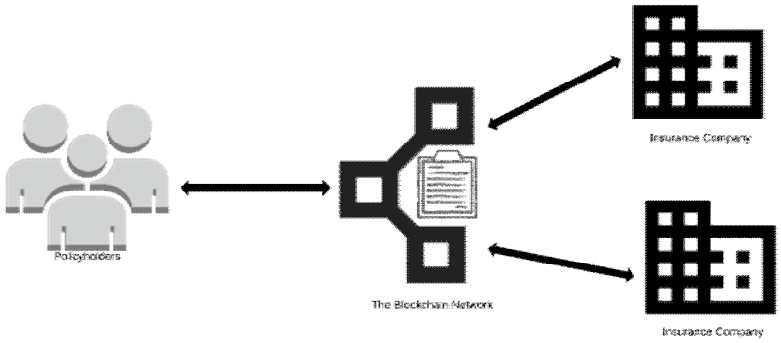


Fig. 1. Primary Entities of Insurance framework

Policyholders are individuals trying to find insurance or have already got insurance for an asset like a house or a car. Insurers are the businesses offering this insurance to the policyholders. Traditional insurance process involved, policyholders to get to the insurance company, browse through all the offers and find one offer which really suits him to accept the offer and insurance company to make several offers. Risk analysis are going to be implemented as chain code which can automatically run when a policyholder is trying to find insurance. All data concerning past claims and assets are owned and carried by the policyholder and doesn't remain with the insurer. This data are going to be wont to perform an easy assessment of the policyholder and therefore the requirements of their asset to supply a risk analysis score which insurers can use to tell their insurance offers. As this technique will have sensitive data that we don't want everyone to ascertain we'll got to implement permissions that control the access to the present personal data.

Two functions in the proposed model performs the functionalities of the making of the primary entities,

1) *Create New Policy Holder:* Policy holder are the primary actor of the Decentralized Insurance application module. They are the customers for which the Insurance company work for the customers. Policyholder will be connected to the blockchain network using a peerAdminCard which is accepted by the consensus algorithm of the block chain network. After accepting the card, policy holder can create their account in the respective Insurance company and can enjoy the policies and offers made by the Insurance company. Policyholder can also apply for claim for a particular asset which he have applied insurance for and can also renew the policy time period by contacting the Insurance company for which he applied Insurance.
2) *Create New Insurance Company:* In Insurance company function, Insurance company that are being in the blockchain network can be viewed by the user and it can be searched for all other insurance company in the blockchain network. Insurance company which is created using the Post method in the function is posted to the blockchain network which can be viewed using the function Insurance company. Insurance company are responsible for the creation of Insurance offers to the policyholders and processing the claims for the policyholders.

B. Major Components of the Model

The major components of the model are a ledger and a database. Ledger using Hyperledger fabric 1.1 are often wont to write smart contracts and implement on both client and therefore the server side for transaction and initiating the method. The network consists of several nodes which can take one of the roles: clients that just send transactions within the system, validators that participate within the consensus, auditors which will passively see a specific number of transactions within the system, and regulators which will enforce policies without necessarily participating within the consensus.

Functionalities such as,

Plays making the core components of the model.

1) *Creating New Asset:* In Create new asset function, policy holder will be able to add his/her asset to his policyholder account created with respect to the insurance company. After upon creating the asset it will be visible on the My Assets division. Assets will be created using the namespace used in the skeleton of the BNA file and it will be created using an ID which is in turn respective to the name of the policy holder ID. Policyholder can add as many assets they want and the time period of the insurance for which the policyholder will be paying the insurance for the asset. The asset will hold a value respective to the type or the worth of the asset. All Assets which a policy holder have can be viewed by the insurance company and can make the insurance offer to the policyholder for the assets which he have and can wait for the policy holder to accept the insurance offer. After upon accepting the insurance offer the policy will be applied to the asset which the policy holder have. Once the insurance policy period overs for a particular asset, policyholder can claim or renew the policy period for the asset which he applied Insurance. Asset will determine the risk analysis value for the policyholder to claim the insurance after the Insurance period.
2) *Making Insurance Offer:* Make Insurance offer module in the Decentralized Insurance application is used to create the Insurance offers to the policyholder for their respective customers by the Insurance company. Insurance policy are issued to the policyholders by creating a unique id to the insurance offer made to the policy holder. These Id are stored in the blockchain network using consensus. Insurance offer can be sent by any of the insurance company if there are one or more insurance companies in the network

C. Blockchain Framework

The framework has smart contracts that govern the principles for transactions. A block is made within the insurance blockchain network when the peer nodes within the validators run consensus over a group of transaction results. Each smart contract contains an endorsement logic, which specifies under what conditions a transaction are often executed by the smart contract. The endorsement logic is executed by a group of endorsers who access the blockchain to work out whether contract conditions are satisfied.

D. Smart Contract for Business

The blockchain maintains execution and results of every transaction and ensures that the clients don't falsely accuse the insurance firm, which the insurance firm is in charge of all services that it provides. Figure 2 shows the essential workflow of the framework. Smart contract registers the clients to the insurance system. During its initialization, a structure of client object is made within the database. It contains client attributes like client unique id because the key and other client attributes as values.

Smart contracts are written with business in mind which is very essential to validate stuffs that rotate around the insurance process. These smart contracts are responsible for the secured risk analysis that are performed as part of the insurance process. These are piece of code that provides total security to the application. Let us see the demonstration with a simple diagram.

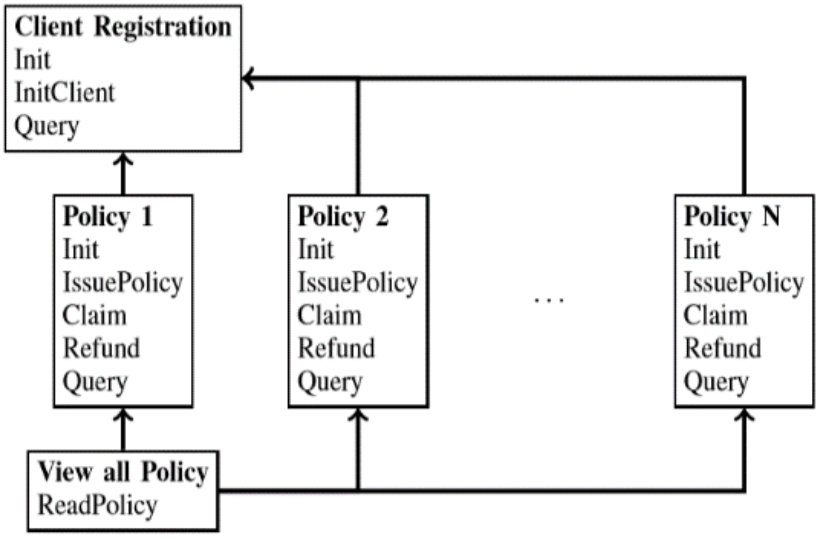


Fig. 2. Smart contract of Insurance blockchain framework.

E. Transactions in Framework

In the proposed blockchain network, client submits transaction request to the insurance company. The request consists of smart contract method and client attributes needed for the tactic to execute. The transaction is signed by agent and further endorsed by the endorsers of that specific smart contract. Upon validation, agent submits the transaction to the ordering nodes to chronologically order the transactions. Then, the nodes in the network run the core consensus algorithm with all received transactions, and adds the new records to the blockchain.

Functionalities which are responsible for transaction in the framework are,

1) *Creating Claim:* In claim, Policyholder can view the claim Id respective to the claim applied to the Insurance Company. With Claim Id, Insurance Company will accept the Policyholder claim and process the application. After processing the application, the respective amount for the insurance policy will be credited to the policyholders account in the view of the profile division. In create claim, Policyholder can able to create the claim or apply the claim via the website to the Insurance company for which the policyholder applied for Insurance. After creating the claim, the insurance company will be notified with the Insurance that applied for claim. After accepting the claim, claim id will be created and it will be stored in blocks of the blockchain which will be used to detect fraud done in insurance industry.
2) *Accepting Claim:* After which the claim is created and applied to the insurance industry, insurance industry in turn run the consensus algorithms on the application and detect the risk analysis of the application. If the risk factor is less, then the claim is accepted by the insurance industry and the applied amount for the claim is credited to the account of the client.

IV. IMPLEMENTATIONS AND RESULTS

Experiments have been performed on the network to figure out the robustness of proposed insurance framework. The chain code for smart contracts was developed in Golang v1.8 and deployed on hyperledger fabric v1.2.0. The experiments were carried out on a system with a Hexacore Intel Xeon E5-1650 v2 (3.50 GHz) processor and 8 GB RAM, running Ubuntu 16.04 (64 bit). We computed the confirmation time of a set of transactions while varying the number of peer nodes in the network.

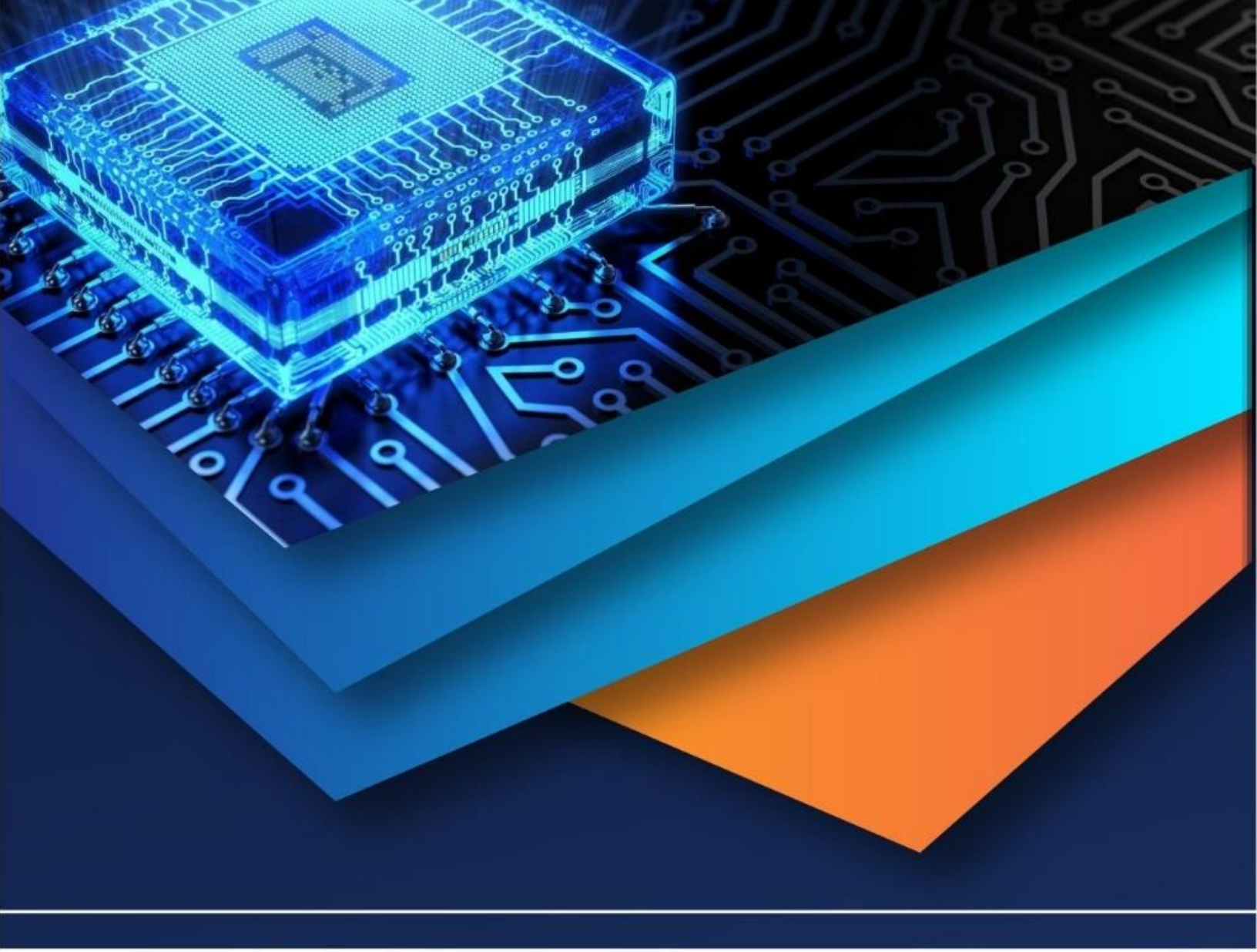
The results of the implementation gives us a complete understanding of how hyperledger and blocks of blockchain works. The implemented model has ten methods which perform the application functionality.

V. CONCLUSION AND FUTURE SCOPE

This paper proposes a blockchain-based framework for implementing insurance transaction processes as smart contracts. Experiments conducted to study the scalability clearly showed the parameters used during blockchain creation should be chosen carefully, as they have a direct effect on the network latency. Though the database is currently not encrypted, it can be encrypted with fine-grained access control. In our model, each smart contract has its own set of endorsing peers, and this can be extended even to the transaction level, to enable separate set of endorsing peers for each transaction. In future blockchain is going to influence all the industry domains. These kind of application can be also extended to all domains also.

REFERENCES

[1] Mayank Raikwar, Subhra Mazumdar, Sushmita Ruj, Sourav Sen Gupta, Anupam Chattopadhyay, and Kwok-Yan Lam, “A Blockchain Framework for Insurance Processes”, in Proceedings of IEEE, ISSN 2157-4960, Accession Number 17661872, 02 April 2018.
[2] Vukoli´c and Marko, “Rethinking permissioned blockchains,” in Proceedings of the ACM Workshop on Blockchain, Cryptocurrencies and Contracts, ser. BCC ’17. New York, NY, USA: ACM, 2017.
[3] W. Li, A. Sforzin, S. Fedorov, and G. O. Karame, “Towards scalable and private industrial blockchains,” in Proceedings of the ACM Workshop on Blockchain, Cryptocurrencies and Contracts. ACM, 2017, pp. 9–14.
[4] Cachin and Christian, “Architecture of the hyperledger blockchain fabric,” 2016.
[5] Maher Alharby and Aad van Moorsel, “BLOCKCHAIN-BASED SMART CONTRACTS : A SYSTEMATIC MAPPING STUDY”, Dhinaharan Nagamalai et al. (Eds) : AIS, CSIT, IPPR, IPDCA - 2017 pp. 125– 140, 2017.
[6] Fabrizio Lamberti, Valentina Gatteschi, Caludio Demartini, Metteo Pelissier, Alfonso Gomez, and Victor Santamaria, “Blockchain can work for car Insurance”, IEEE Consumer Electronics magazine, Digital Object Identifier, Date of publication: 13 June 2018.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY