

INSURANCE CLAIMING PROCESS BASED ON BLOCKCHAIN TECHNOLOGY

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Abstract : In Modern society, blockchain technology are utilized to enhance the traditional companies . Insurance industry is also one type of traditional companies . These companies suffer many issues that are leading to decrease their efficiency in modern community. The insurance industry is primarily dependent on multiple processes between transacting parties for initiating, and maintaining different kind of policies. The main problems of these companies are that their operations are not transparent. In addition, to considering the potentiality of the smart contract of blockchain, determining insurance must be transparent. The application of blockchain in FinTech processing requires a deep knowledge explore for underlying business processes . In this study, we focus on the design of an well organized approach for processing insurance related transactions based on a blockchain-enabled platform.

IndexTerms - blockchain,fintech,smartcontracts,insurance.

I. INTRODUCTION

A blockchain is a public ledger distributed over a network, recording transactions (messages sent from one network node to another) executed among network participants. so you can use it to prepare your manuscript. In a traditional insurance companies, both low and high-risk users are considered equal .

Blockchain technology provides a revolutionary way for building secure distributed systems. Initially designed as a system service for detecting double spending in cryptocurrency systems, blockchain is widely applicable to many business applications where there is a requirement of trust among distributed parties. At a high level, a *blockchain* is a distributed ledger service implemented by multiple participants, with each of them storing a local copy of the ledger. The ledger's consistency is achieved by certain consensus protocols involving all participants. Blockchain systems may choose from a broad scope of consensus protocols depending on the trust model. Immutability of the ledger is managed by a combination of cryptographic primitives and open distribution of the ledger [1].

In common practical settings, business rules are encoded as smart contracts [2], [3] that require access to the blockchain. In terms of insurance processes, a smart contract can be written to register clients interested in purchasing policies offered by the company, enable them to file claims, and receive refunds. The smart-contract based distributed ledger will inherently prevents any sort of fraudulent transactions if the requests or actions do not conform to the rules of the contracts.

This study of these paper represents the performance and security concerns of insurance claiming processes by designing a blockchain based decentralized solution . The main purpose of the blockchain based decentralized solution for the insurance domain is —

(a) to automate and speed up business processes in the insurance industry, from client registration and policy issuance to claims handling, (b) to make fraud-detection easier using decentralized digital repository, (c) to make client data confidential and accessible only to the authorized parties, (d) to reduce administrative and operational costs, and (e) to enable regulators and auditors to detect suspicious transaction patterns and market behaviors.

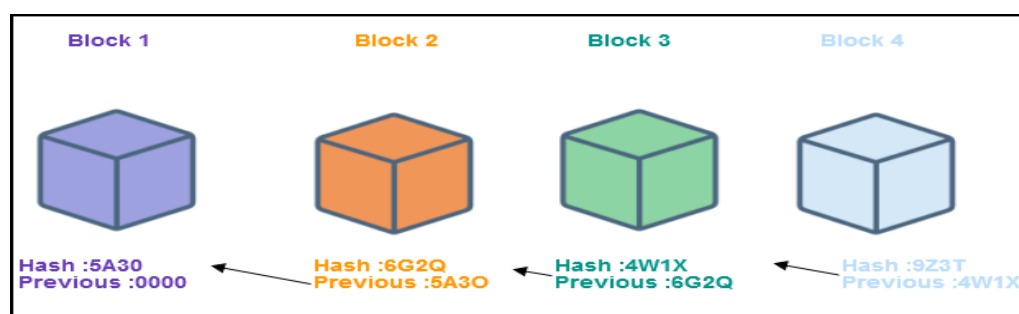


Fig. Blocks in Blockchain

II. BLOCKCHAIN IN INSURANCE

Blockchain is an decentralized electronic ledger (either public or private) like a relational database that uses a global peer-to-peer network in providing an open platform in which transactions are recorded chronologically. In comparative to conventional databases, rules about a transaction that are tied to the transaction itself, and not at an whole dbase level, or in the application can be set with interest in various industries with the financial industry leading the way. Other includes sectors like asset management,

healthcare, insurance, different form of supply chain and logistics, housing and government. it allows a distributed transaction to be distributed thereby creating a chain of transactions where all parties trust the system. It is the most important technology to emerge and analyst belief this would change our world like the internet did two decades ago more importantly if there is a strong collaboration among players in the industry. Blockchain is a technology for a new generation of transactional applications that establishes trust, accountability and transparency while streamlining business processes.

Consider it an operating system for associations. It can possibly unfathomably lessen the expense and multifaceted nature of completing things. It's basic for Blockchain innovation to be created following the open source model so a minimum amount of associations will mix around it—and receive its full rewards. In light of the open source rules, members can believe that the Technology will satisfy their necessities and fit in with industry gauges guaranteeing interoperability between Blockchain applications. Additionally, by sharing the essential layer, the members can concentrate their individual endeavors on industry explicit applications, stages, and equipment systems to help transactions.

Blockchains take care of explicit issues, which databases can't do yet. They are completely dispersed, profoundly deficiency tolerant. It doesn't require brought together expert, giving outsider trust without trust, while decreasing twofold spending and exceptionally low transaction costs.

The Blockchain is viewed as a primary mechanical development of Bitcoin, since it remains as evidence of the considerable number of transactions on the system. A block is the 'current' some portion of a Blockchain, which register a some or all the ongoing transactions, and once accomplished goes into the Blockchain as changeless database. Every time a block gets finished, another block is produced. There is an innumerable number of such blocks in the Blockchain. To utilize traditional protection as a similarity, Blockchain is a like a full record of protection transactions. Transaction bitcoin are entered one by one in a Blockchain simply the manner in which protection transactions are. Block, in the interim, resembles people.

Different incorporates areas like resource the executives, medicinal services, protection, diverse type of inventory network and coordinations, lodging and government. it enables a circulated transaction to be dispersed in this way making a chain of transactions where all gatherings trust the system .

A. How is Blockchain related to Bitcoin ?

Blockchain manufactures the prevalent digital money, Bitcoin, conceivable, guaranteeing that Bitcoin go between gatherings are money like: remarkable, immutable and last. The way Bitcoin actualizes Blockchain makes Bitcoins an unregulated, restriction safe shadow cash The Blockchain is see as a fundamental mechanical advancement of Bitcoin, since it remains as verification of the considerable number of transactions on the system .

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B. What Does Blockchain Technology Offer For Insurers ?

Blockchain-based systems could help profoundly improve the protection business. Be that as it may, its effect could be a lot more extensive. Protection claims preparing and settlement are zones where a client purchases an approach and the arrangement sets out standards under which one gets inclusion. The dimension of ability required for case agents or the examiners, who explore, arrange and settle claims, fluctuates legitimately with the idea of misfortune, under the purview whose law applies to the agreement creation, translation and authorization, one of central purchaser assurance issues inside the protection estimating, endorsing, and guarantee settlement process, the guidelines, otherwise known as the principles based cases preparing or generally a casting a ballot based cases handling, for the most part pursued by shared back up plans (distributed). In the case procedure an individual safeguarded and different gatherings need to send a few reports, otherwise known as information, some of which may not be accessible in computerized position.

The settlements are additionally subject to translation of the principles that apply to the item and policyholder circumstance. This leads guarantee processor to apply principles and settle on choices and apply before being paid out. This goes into structure motivating force models to empower gatherings to choose First this makes the undeniable inquiry of common trust between gatherings - the safety net providers and their system to have the option to work together inside the ecosystem in a straightforward manner to anticipate any misrepresentation.

Blockchain might almost certainly avoid extortion on the grounds that the transactions are straightforward and there will be less imitations or control of strategies and contract. Second, if these highlights could be incorporated with the current market foundation, permitting the auto-execution of coded rationale installed into keen cases.

C. Can Blockchain Reduce Fraud Directly ?

Blockchain might be valuable in decreasing misrepresentation identified with the trustworthiness of a strategy or guarantee or vehicle (any advantage). By keeping up the respectability of the benefit through different proprietors, Blockchain will limit forging, twofold reserving, report or contract modifications. It has the potential in future to be utilized for personality the executives, however this idea has various issues that should be worked out. Be that as it may, utilization of the Blockchain does not ease the risk evolved with the numbers of first party and third party frauds. Fraud detection and investigation systems will still be required. This would be right that whether the Blockchain were maintained by an individual financial organization, society of financial organization operating a network or utility, 3rd party processor, or even IBM itself.

III. Proposed Model for Blockchain in Insurance

A) Aim of the Study

The aim of design model is to implement the processes of an insurance company as smart contracts, and place the contracts in a block chain-enabled distributed platform, for both execution of the contracts and storage of the results.

B) Objectives of the Study

The objective of Building a blockchain-based framework for implementing insurance transaction processes as smart contracts. Our aim was to show that how blockchain could bring innovation to insurance sector.

C) Entities in the Model

Primary entities in our model are – the *Claimer*, who is covered by insurance and requests for insurance policies, submits claim requests, and receive refunds, and the *Insurance company*, who acts on behalf of the client, and processes the client’s requests to the blockchain network.

Claimer : who is covered by insurance and requests for insurance policies, submits claim requests, and receive refunds.

Insurance company : who acts on behalf of the client, and processes the client’s requests to the blockchain network.

Contracts : consist of insurance policies type ,contract terms and conditions, contract validity which is signed by Claimer.

Submit claim : If Claimer wants to request for any claims on any particular ,then through submit claim he can claims his claim to complete the process.

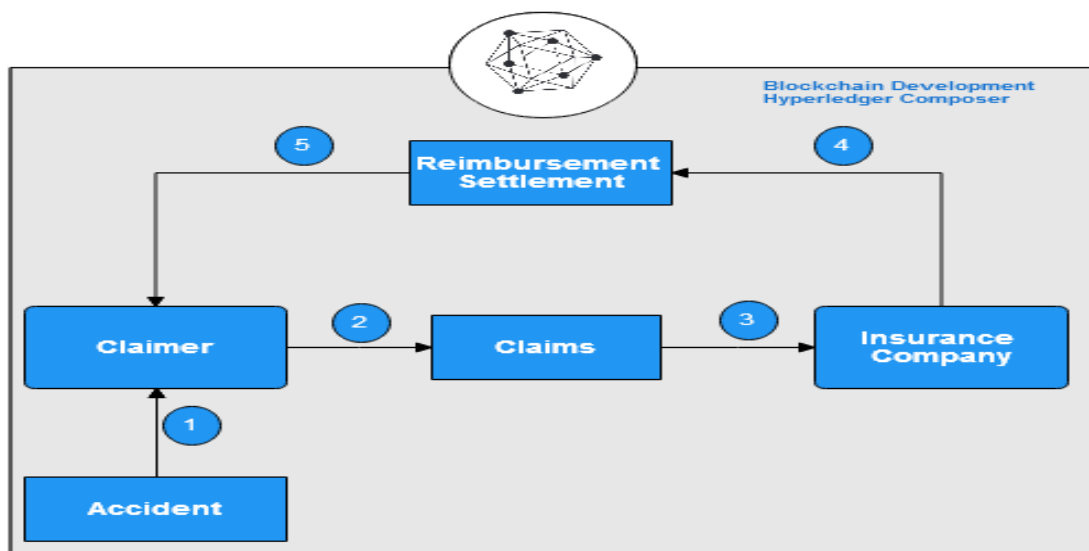


Fig. Proposed System model of Insurance blockchain framework

IV. Design Instantiation

Hyperledger is also an open source project by the Linux Foundation so our instantiation could be reproduced by others.

A. Hyperledger Basics

The Hyperledger Project aims at creating an enterprise-based, open-source distributed ledger framework. One of the main Hyperledger projects is Hyperledger Fabric, a blockchain framework implementation designed to support pluggable modular components implementations (consensus, membership, cryptography library). At the core of Hyperledger Fabric is the notion of chaincode smart contracts; transactions in Hyperledger Fabric are executed by those chaincodes. More precisely, the authorized peers run a consensus protocol for executing replicated state machine accepting three types of transactions:

- (1) Deploy: Installed a chaincode on the peers and ready to be invoked.
- (2) Invoke: A particular transaction can be invoked . chaincode which may read and write entries in its state accordingly.
- (3) Query: returns an entry of the state directly from reading the peer's persistent state.

To simplify application development on top of the Hyperledger Fabric blockchain infrastructure, a set of collaboration tools for building blockchain business networks, called Hyperledger Composer, is being incubated in the Hyperledger Project. To digitize business networks, it then suffices to define a business network that consists of:

Assets: define the assets that are exchanged in blockchain-based use case.

Transaction logic: define the executable transaction processor functions: the transaction processor functions will run on a Hyperledger Fabric and have access to the asset registries that are stored in the world state of the Hyperledger Fabric blockchain;

Participants: define the participants and access controls for what roles exist and which roles can execute which types of transactions.

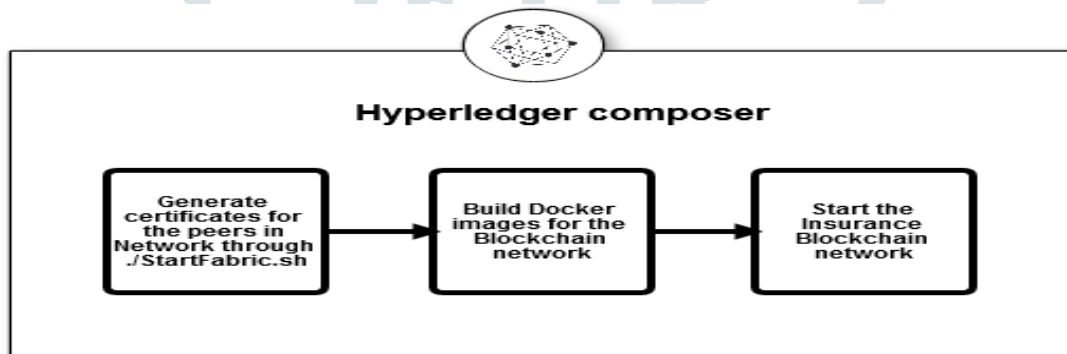


Fig . Hyperledger composer development cycle

B. Hyperledger composers project file structure in Insurance process :

The file structure of Hyperledger composer consists of a folders and files along with a few configuration. The files are :

- Model File (.cto)
- Script File (.js)
- Access Control (.acl)
- Query File (.qry)
- Business Network Archive (.bna)
- Configuration file (.json)

Once the model and script files are compiled. There Archive file is created called Business Network Archive .bna Which is deployed or installing on the Hyperledger Composer.

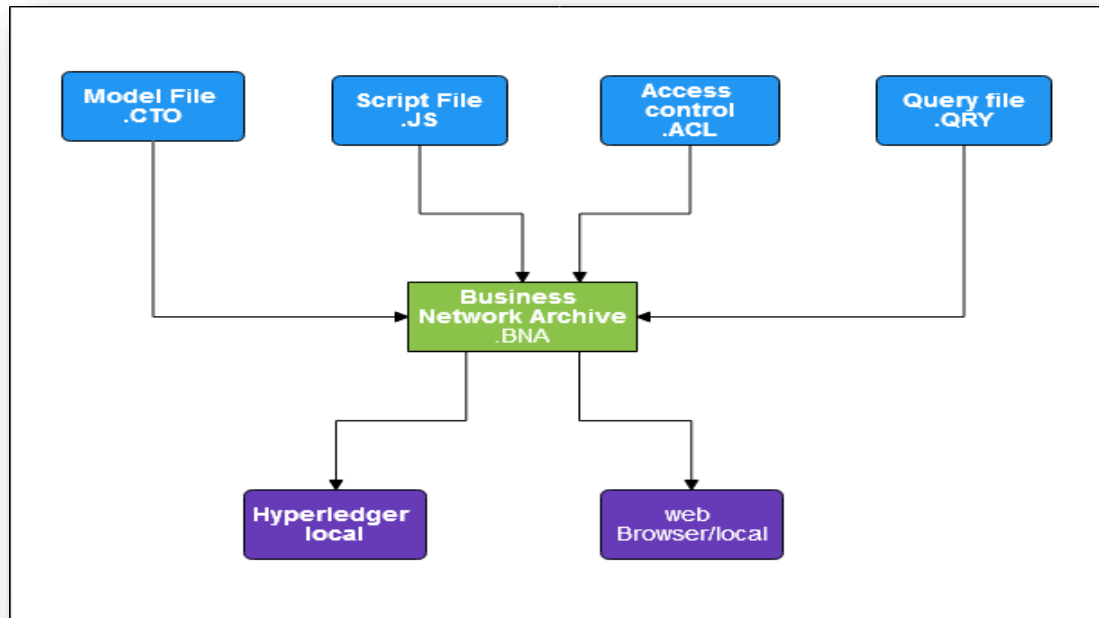


Fig. Hyperledger composers project file structure

A) Model File (.cto) :

Hyperledger Composer includes an object-oriented modeling language that is used to define the domain model for a business network definition. A Hyperledger Composer CTO file is composed of the following elements:

- A single namespace. All resource declarations within the file are implicitly in this namespace.
- A set of resource definitions, encompassing assets, transactions, participants, and events.
- Optional import declarations that import resources from other namespaces.

B) Script file(.js) :

A Hyperledger Composer Business Network Definition is composed of a set of model files and a set of scripts i.e. .js file. The scripts.js file may contain transaction processor functions that implement the transactions defined in the Business Network Definition's model files.

C) Access control file(.acl) :

Hyperledger Composer includes an access control language (ACL) that provides declarative access control over the elements of the domain model. By defining ACL rules you can determine which users/roles are permitted to create, read, update or delete elements in a business network's domain model.

D) Query file(.qry) :

Queries in Hyperledger Composer are written in a bespoke query language. Queries are defined in a single query file called (queries.qry) within a business network definition.

V. Experiment and Results :

Development on Hyperledger Composer Blockchain development by deploying a sample business network

Step : Start Hyperledger Composer Online . Click on Deploy a new business network.

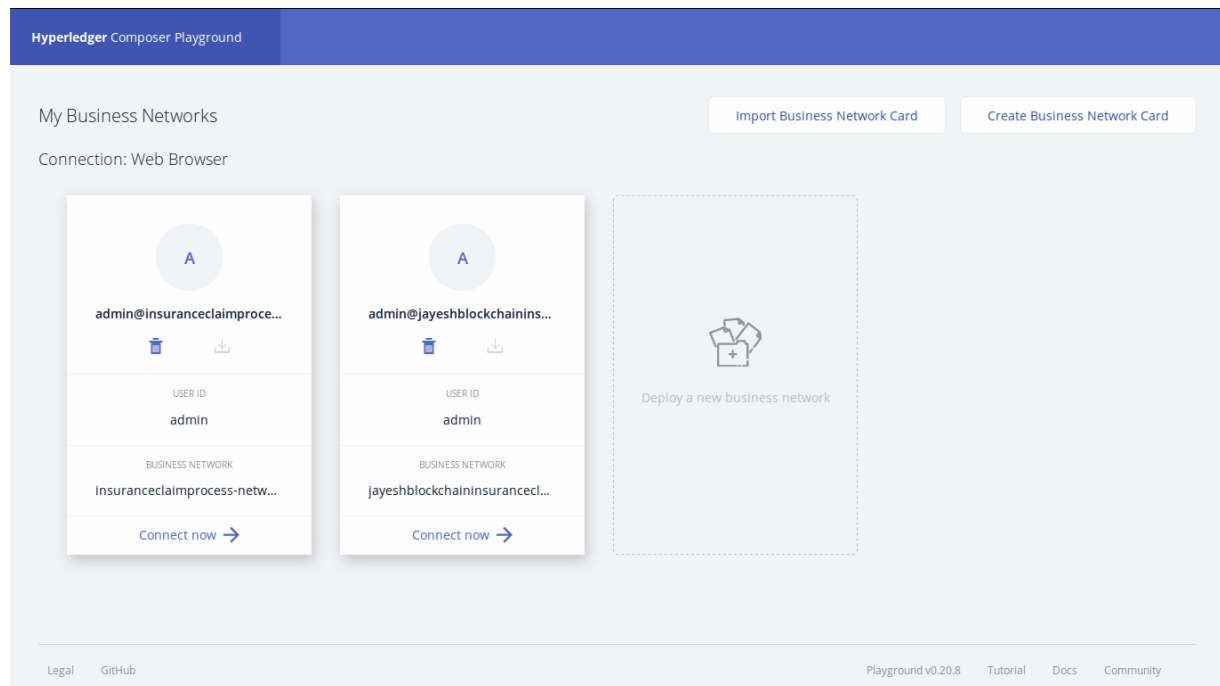


Fig . Deploy a Sample business network

Step : Now, Click on “+Add a file...” from left panel and select “model file (.cto)” and write a code.

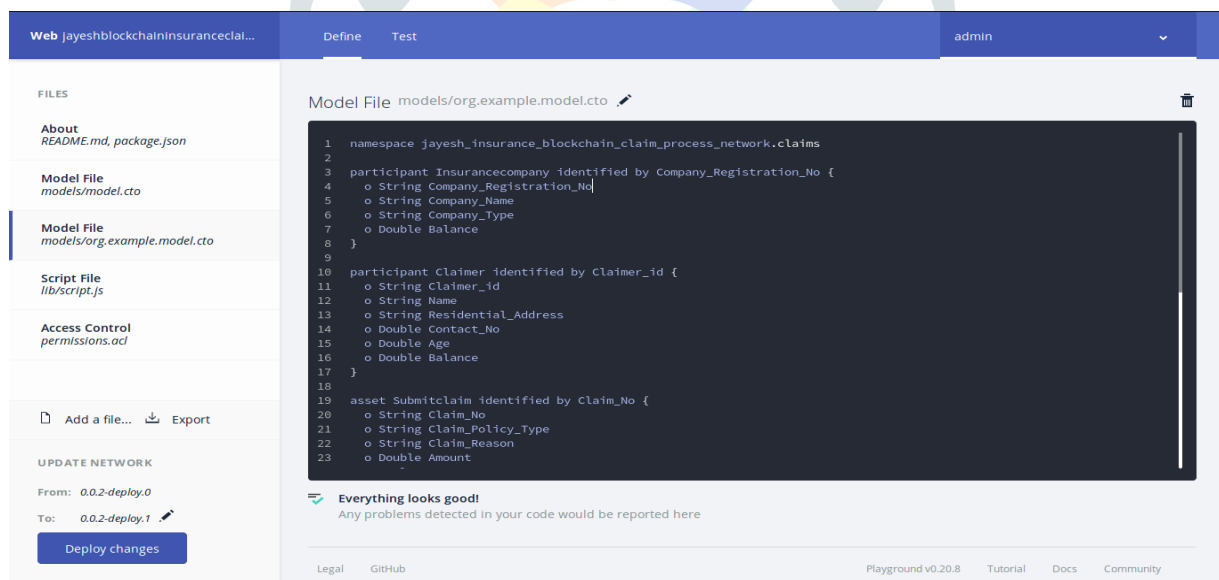


Fig. Create a org.example.model.cto file

Step : Now, Click on “+Add a file...” from left panel and select “Script file (.js)” and write a code.

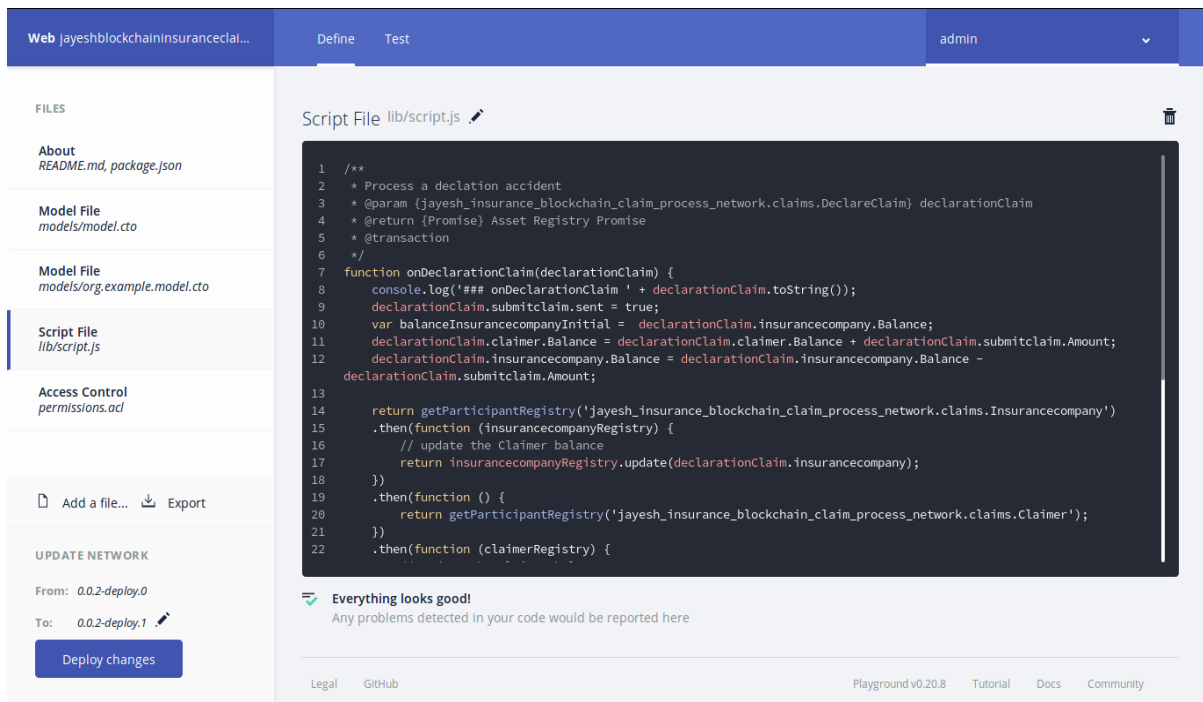


Fig . Create a script file script.js

Step : Now, Click on “Submit claim and create a new Asset by filling right Information to it.

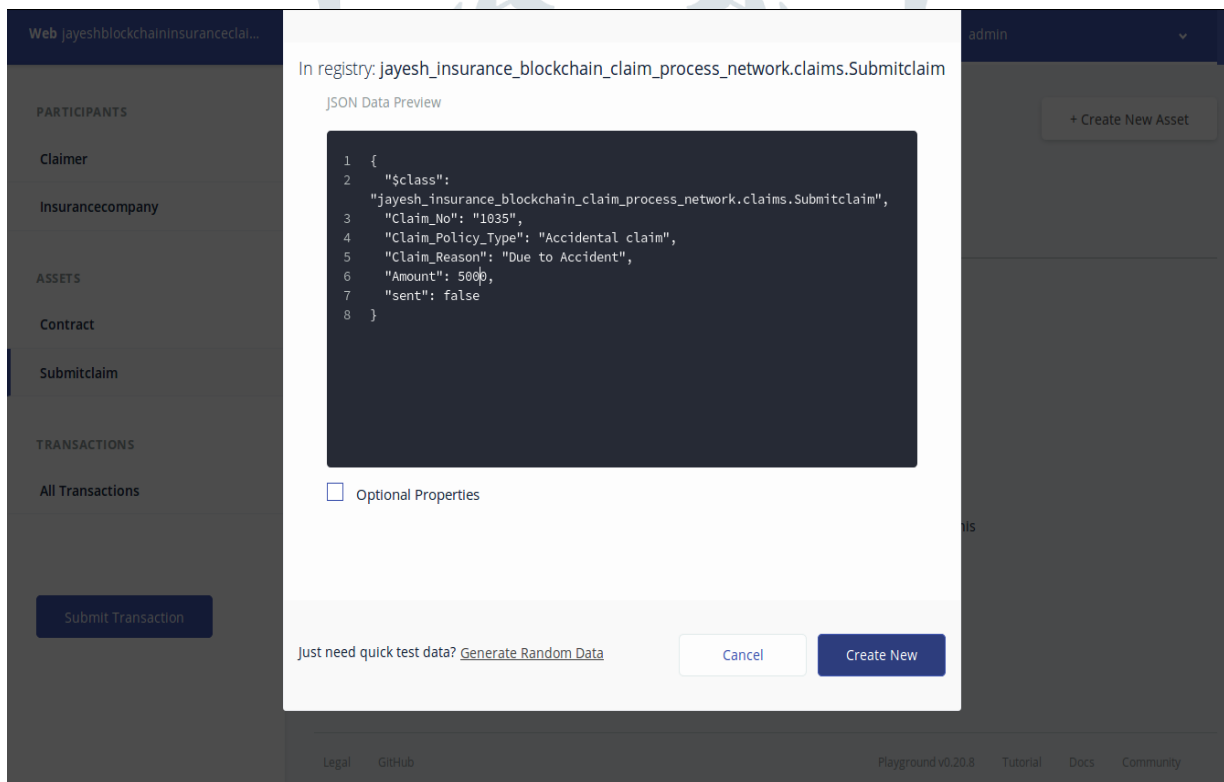


Fig .Create a New participant for Submit claim

Step : Claim Reimburse successfully .

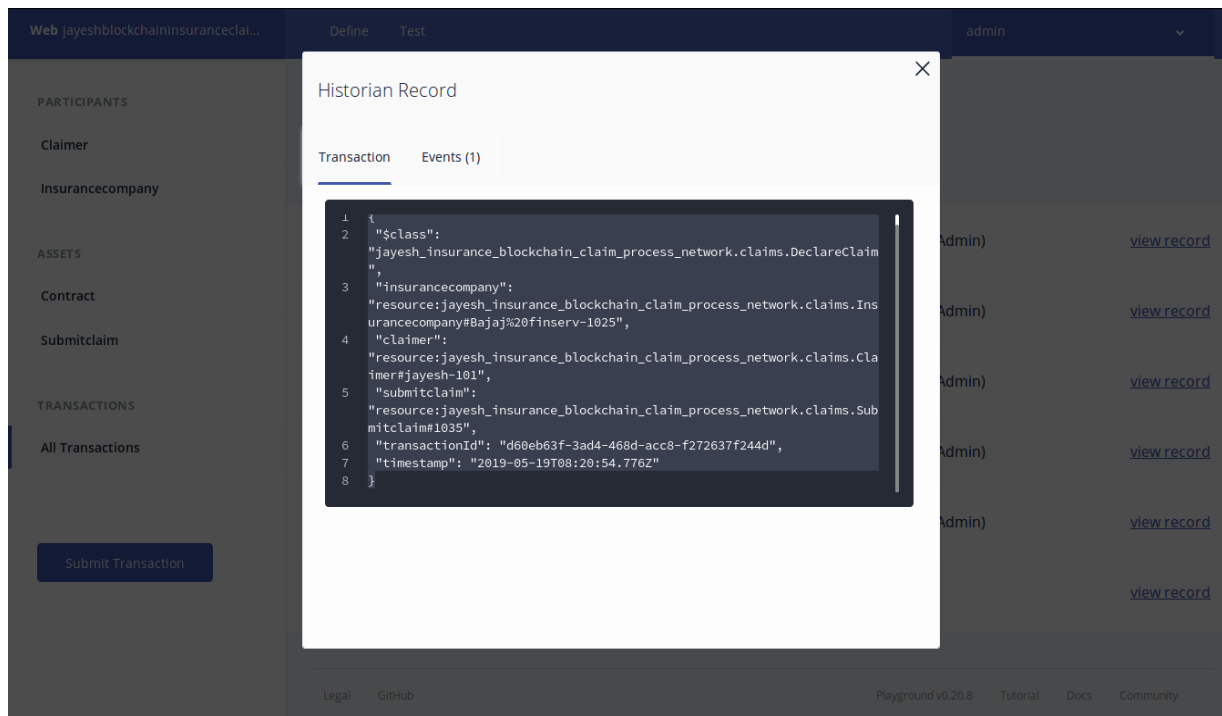


Fig . Transaction Block.

VI. Impact of Blockchain in Insurance Domain:

Third-party transactions : Blockchain can handle the increase in third-party transactions and claims made through personal digital devices. Blockchain helps reduce administrative costs through automated verification of claims/payments data from third parties. Now, insurance companies can quickly view past claims transactions registered on blockchain for easy reference. This promotes higher degrees of trust and loyalty between the insurer and customer.

Fraud detection and prevention : One of the most compelling reasons insurance companies should investigate blockchain is its potential to detect and prevent fraudulent activity.

Transparency : Historically, consumer data has been stored behind the walls of insurance companies. Consumers have little in the way of visibility of this data, and instead are given only what the insurance company decides via a portal. And if the information is shared with third parties, the consumer is not notified about it. The open and decentralized nature of blockchain means that consumers will always be able to see the data the insurance company has *and* what is being done with that data.

Trust : It is not unusual for consumers to mistrust insurance companies. Confusing policy terms, high premiums, and long claims processes all contribute to this. The blockchain, specifically smart contracts, bring trust back into the equation by simplifying the insurance contract and, with the help of AI, automating claims. No human intervention required. SURETY.AI simplifies the purchase process to get you the exact coverage you need, while its machine learning algorithm handles payouts without the need for filing a claim.

CONCLUSION

This study proposes a blockchain-based framework for implementing insurance transaction processes as smart contracts. Our aim was to show that, how blockchain could bring innovation in Insurance sector. Moreover, a Blockchain could allow the industry as a whole to streamline its processing and offer a better user experience for customers who have to make a claim.

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