



Blockchain-Based Smart Contracts in Financial Industry

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Abstract: Smart contracts are a self-executing contract that automatically executes when pre-defined conditions are met including financial services industry. Smart contracts, which are enabled by blockchain or distributed ledgers, have been held as a solution to many of the issues associated with traditional financial contracts, which are simply not designed for the digital age. Financial intermediaries raise overhead expenses and enhance regulatory requirements while enabling interoperability for the financial system and lowering risk. This concept aims to adopt smart contracts that will lead to reduced risks, lower administration and service costs, and more efficient business processes across all major segments of the financial services industry.

Index Terms – Investment, block technology, Peer-peer-computing, smart contract, Finance.

I. INTRODUCTION

A standard contract consists of paperwork that outlines the parameters of the agreement and is used to execute the contract. Before the contract terms are finalized, a third party is sometimes responsible for certifying the fulfillment of these conditions by both parties. On the other hand, a smart contract is a self-executing contract whose terms are specified as a protocol. [1]. As money and related papers become computerized, smart contracts are most widely used in the banking industry. Payment processing, clearing/settlement of financial instruments, trade finance, and regulatory technologies such as expedited 'know your customer' certification are all examples of smart contract prospects in the financial services sector. A blockchain is a distributed ledger made up of a succession of blocks that each contains a different transaction. This ledger can only be appended with the new blocks and acts as a source of trust between unknown parties.[2].Smart contracts can be explored to design some real-world applications as decentralized applications such as option contract, credit default swap contract, voting system [3]. Malicious individuals can assault these smart contracts. One of the motivations for adversaries to attack smart contracts is that the contracts contain a certain amount of money that can be obtained through attacks. There have been a few events in the past that have highlighted the failure of smart contracts. [4]. Furthermore, once put on the blockchain, smart contracts are permanent and irreversible. To limit the risk of attacks, potential vulnerabilities in a contract must be analyzed before it is deployed. [5].The security of smart contracts is another crucial issue to consider when building them. In other words, the contract's potential weaknesses could be exploited by attackers for their gain. [6].Smart contracts have certain special qualities because they are often deployed on and secured by blockchain. To begin, a smart contract's programmed code will be recorded and confirmed on the blockchain, making the contract tamper-resistant. Second, without centralized control, the execution of a smart contract is enforced among anonymous, trustless individual nodes. A smart contract, like an intelligent agent, may have its cryptocurrency or other digital assets, which it can transfer when certain criteria are met.[7].Because of the restrictions of Bitcoin's programming language, it is not possible to write contracts that enable loops or withdrawal limits. [8]. In the case of mortgage smart contracts, individuals might save 480-960 USD per loan, while banks could save 3-11 billion USD annually in the US and Europe. Smart contracts can also be used in clearing and settlement processes by banks. More than 40 worldwide banks have joined a group to test smart contracts for clearing and settlement processes, according to reports. [9].Interoperability with older systems and the scalability of blockchains, on the other hand, remain roadblocks to the implementation of such systems. Furthermore, the smart contract implementation must be safe against attacks aimed at stealing assets or altering the contract code.[10]

Smart contracts on the blockchain may be used to exchange anything of value without the need for a middleman. They can also be used to define and enforce rules and penalties that have been agreed upon by two parties in a contract.

II. LITERATURE SURVEY

Using various tools and technologies, the authors have proposed a smart contract system. They have suggested various approaches to control illegal activities in the financial sector.

In [11] Author focuses on the decentralized storage of data using encryption along with blockchain techniques to handle client's fraudulent behavior. In the proposed system, the information related to files is stored in the blockchain and a fair judgment is provided for search and storage

In [8]. Bitcoin is a permissionless blockchain network that facilitates the exchange of cryptocurrencies. Bitcoin is written on a stack-based byte code scripting language with relatively limited computing capabilities. The Bitcoin scripting language does not support the building of sophisticated smart contracts with complex logic. Writing contracts that enable loops or limits, for example, is not possible.

In [10] all peer-reviewed technology-oriented research in smart contracts was mapped out in a systematic mapping exercise. Our goal is to give a survey of the scientific literature as well as to detect academic research trends and uptake. We will focus on peer-reviewed scientific papers to see how academic researchers have embraced smart contract technology and generated scientific outputs.

In [11] they used a systematic mapping analysis to discover and classify all peer-reviewed academic papers on smart contracts in this publication. The goal is to gain a better understanding of present smart contract research fields, identify research gaps for future work, and assess academic acceptance and emphasis patterns. From five separate scientific databases, we collected 188 documents.

In [12] The use of blockchain technology in the financial sector Both private and public blockchains can be used to utilize blockchain technology in the insurance industry. Because private blockchains may only be viewed and written by their owner, they have the advantage of recording the sender of a transaction and all prior transactions, reducing the danger of data tampering. They can also be used to automate current processes.

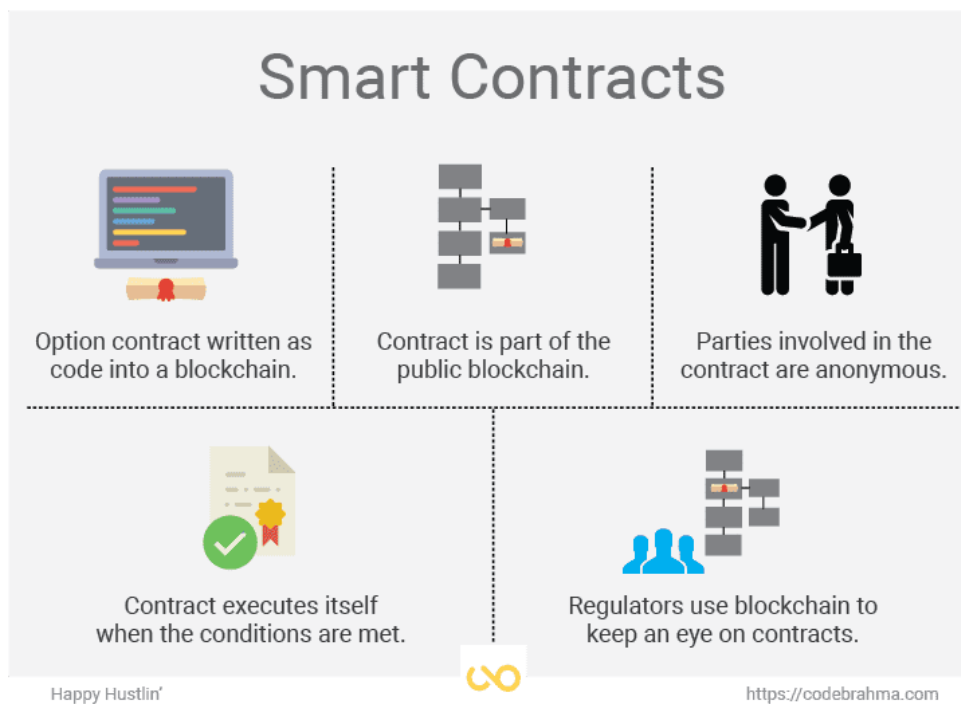
In [13] technology overshadows regulatory problems and technical challenges. A smart contract is a collection of self-verifying, self-executing, and tamper-resistant programmes. Smart contract with the integration of blockchain technology capable of doing a task in real-time with low cost and provide a greater degree of security

In [14] they are reporting a real case of study in the financial sector, applied to the renewable energy exchange in a local district This research focuses on the creation of a Financial Platform based on a private Ethereum blockchain implementation that provides a variety of services for Renewable Energy Sources (RES) investments.

III. PROPOSED SYSTEM

The proposed system looking for ways to reduce its operational costs and the time it takes to process loss claims. Transaction security, process identification, process automation, and payment speed are all advantages of blockchain technology. This paper describes an experimental implementation of smart contracts for financial services based on the Ethereum network. We introduce permissionless blockchain technology that keeps account of all online transactions carried out over the internet. The fee-paying system is implemented using smart contracts, which are more trustworthy than cash cards, which can be misplaced at any time. In future investigations, an incentive-based mechanism could be included in the smart contracts. In future research, an incentive-based mechanism could be added to smart contracts to allow for more dependable and controlled online transaction administration.

- On the blockchain, smart contracts allow anonymous parties to conduct transactions and agreements without the need for a central entity, external enforcement, or legal system.
- Smart contracts typically include a user interface that allows users to interact with existing contracts while adhering to previously defined logic.
- Efficient real-time updates Smart contract execution does not require the participation of third parties or centralized proxy services.
- Low human intervention risk After the smart contract is deployed, all contents of the contract cannot be modified, and neither party in the contract can interfere in the execution of the contract



Fig(1).smart contracts in finance domain

IV. METHODOLOGY

Smart contracts for online transactions were the theme of this session to educate people on how blockchain technology aids in payment and secure tracking of all transaction data. Smart contracts and blockchains make it possible to carry out transactions and agreements amongst diverse, anonymous parties. Traceable, transparent, and irreversible transactions are used.

Short-term years wise contracts will be made utilizing Blockchain smart contracts, as well as online payment collection. This blockchain technology does not require authorization and keeps track of all anonymous transactions carried out through smart contracts.

For each transaction, payment for the need will be made through a Blockchain smart contract. Users can pay for their purchases online in advance utilizing the Blockchain payment system. The use of this smart contract Management method will prevent illegal money handling in this primitive sort of online transaction.

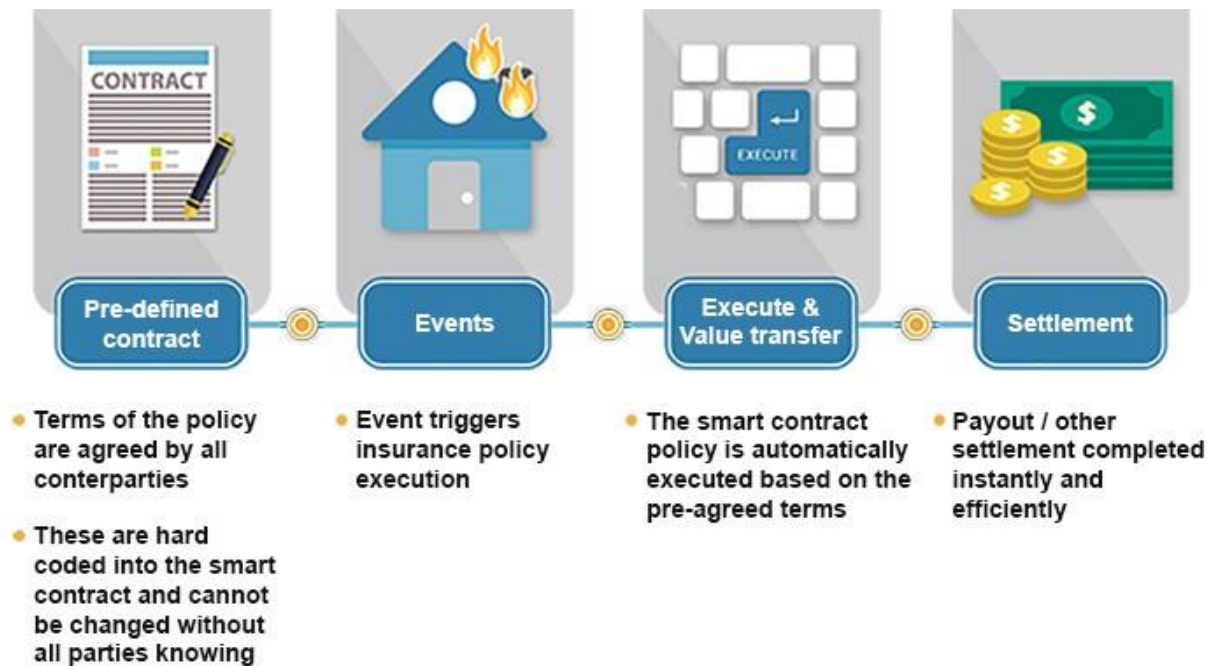


Image Credit: Draglet GmbH

Fig(2) Smart Contract Working Modal

V. CONCLUSION

In the subject of online transaction systems, new and perfect models are proposed all the time. In this notion, a method for online transaction collection and better payment distribution in an intelligent Automated system is proposed. The payment was formerly collected either by humans or by an automated system. Daily, hundreds of transactions will take place online without sufficient security, necessitating the creation of a secure and trustworthy method to manage the online transaction. We introduce permissionless blockchain technology that keeps track of all transactions without the need for human involvement.

VI. FUTURE ENHANCEMENT

The future study seeks to develop a private blockchain to handle automated claims processing processes, both on request from users and directly from system or software management. In this method, the private blockchain will receive real-time back-end confirmations, and an automatic claim evaluation and loss computation will be made based on statistics and reports kept in the blockchain.

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