

Design of Real Estate Contract Management System based Blockchain

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Abstract. The existing real estate transaction is highly interested in a contract that is guaranteed to be reliable due to anxiety about the threat of fraud. In particular, it is timely and economically efficient to manage contract information online and prevent forgery and duplication of contract information. Blockchain technology is emerging as an alternative to the enormous cost and reliability issues associated with offline real estate contracts. If blockchain technology is applied to online contract management, reliability and scalability are efficient and confidentiality can be ensured. Therefore, in this paper, we designed an Ethereum-based online real estate contract management system among blockchain technologies. The real estate contract management system enables online contract management and discrimination of contract forgery through blockchain. In particular, it was possible to prevent fraud until the contract was concluded and the contract was terminated.

Keywords: Real Estate Trading system, BlockChain, Ethereum, Smart Contract

1. Introduction

The domestic real estate market trading volume year deal number is increasing, but real estate deals damage and fraud continued to increase it. Contract fraud prevention for the procedure in accordance with the agreements in progress, but the process of loopholes to exploit various fraud incident occurs there. Real Estate Contracts four groups to avoid for the third -party intermediaries via a contract that signed this approach is common. However, fraud occurs due to the lack of credibility of a third- party broker. And the third party is lacking, not duplicate contract fraud is also the case frequently occurs there[1].

In order to solve these cases, it is necessary to have a technical system that prevents forgery of contracts and guarantees trust in advance. Therefore, the this paper reliability is 100% with guarantee block chain technology using P2P trust -based networks by building brokers without a secure real estate The agreement is established can be in the system was designed . This system was able to forge and falsify by creating a contract using smart contracts on the basis of Ethereum, a distributed computing platform. Present in paper contracts for which management API for Open API to haejumyeon provide real estate Brokerages, Stock Brokerages such as contracts related to service contracts for management for the functions that will provide be it. The platform API for utilizing Brokerages are present on the system of small, only fees you pay online on safe and reliable in the contract to manage a low cost is possible. In Chapter 2 of this paper, a related study was prepared, and in

Chapter 3, a real estate transaction management system was designed. Finally, the fourth chapter, conclusions and the future work is proposed.

2. Related Studies

The paper in the in the introduction mentioned block chain -based systems to develop for the block chain related studies out look.

The block chain Ether Solarium is proof-of-work(Proof of Work PoW) algorithm is used [2]. PoW is Bitcoin (bitcoin) the to acquire used algorithms in computer hard math problems inside the chain participation by all nodes that the issue released any number (nonce) to discover the behavior you are. Any of a number found node to the transmission is successful, and Fig. 1, and as the previous block and the hash to the value by which connecting structure has is.

Also applicable for node schedules the bit coin service and this drilling (mining) referred to. This only as transfer 2 kinds on the way by there is performed the first second is above mentioned is mined, the other users of Bitcoin to transfer when the transfer takes place. At this time, the output section (output section) in which the user for some time as to whether transfer of my dragon platter sent is [3].

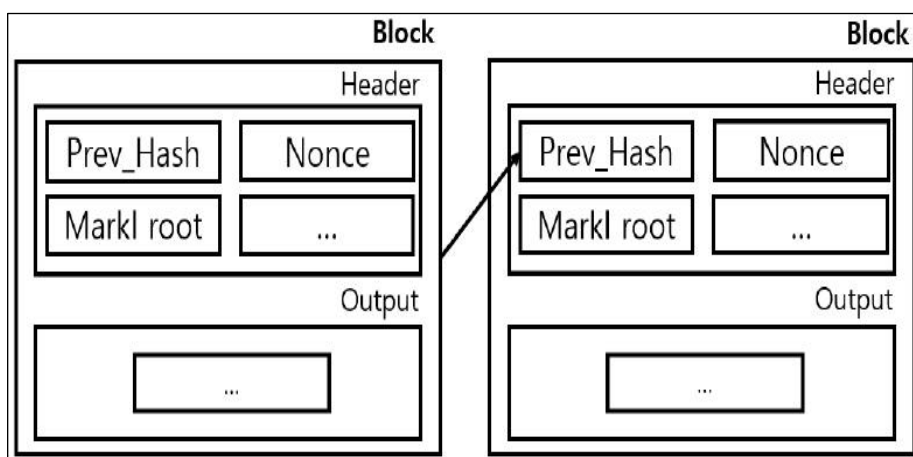


Fig. 1. Block Head Architecture in BlockChain

Smart Contract is Nick Szabo is 1994 years first proposed the concept existing contract (Contract) is written there is agreement the conditions to implement this person directly be done , but the digital contract (digital contract) is the condition according automatically the vote that will . Block chain is a number of the node data validation and, proven ones based between the nodes sharing the way through digital data trust generates . Believe can in a data -based smart contract is to block the chain together was at issue [4].

Smart Contract techniques apply Block Chaining operation structure follows the same. Assuming that there are buyers and sellers who want to purchase the goods, the seller registers the goods to be sold on the blockchain. The smart contract the transaction in accordance with that in the block chain new node registration and real-time updating i.

Buyers search (Query) to use that block the chain to query can have the goods if you buy smart contract is that of the node database updating it.

Ether Leeum's programming available to block chaining various blocks chain services to develop to be added can be there. Ethereum is a distributed network platform that can be operated as a client program [5].

Leeum provider of currency units ether as a deal for a fee are used. In Ethereum, programming is not required in Gold Dragon, but it is supported for smart contracts. The sender and the receiver between a transaction (the financial transaction) or contract non-financial transactions) in the form and constitutes , passed when the system to protect from dimensional charge of ether to together passes . Numismatic type plain deal for ether, a small payment for finney, trading upon fee payment for szabo, wei is there [6].

Fig. 2 is a provider Solarium -based smartcontract that is driven the process shown would. The contract to be developed is included in the block and transferred to other blocks in the blockchain to be executed during verification. Smart contract is to be executed in order Ether Solarium virtual machine (EVM) to over the drive is 7].

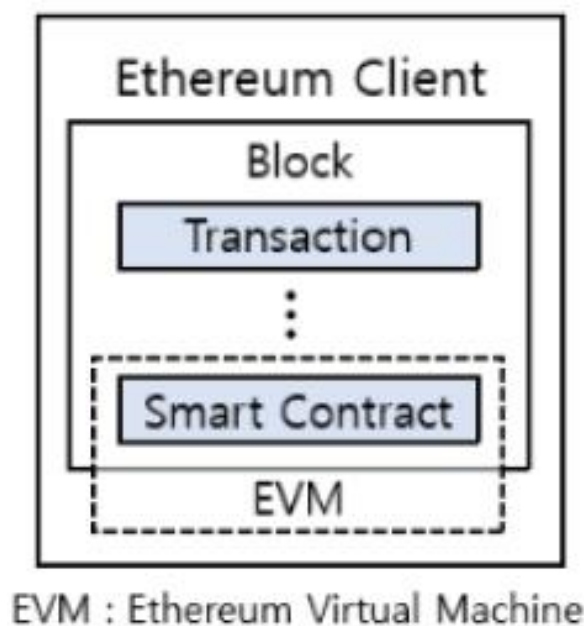


Figure 2. Smart Contract Runtime Environment in Ethereum

3. Real estate transaction management system design

Real estate transaction management system is offline procedures included can only free trading contracts online on which management will. This system is the two kinds of advantages are. First, it prevents forgery and alteration of the contract . Present the thesis contract information and contracts storing and managing to block chains leverage. The block chain contract storage and to manage if trust -based networks on a contract to save because

the contract is forgery impossible. Second, it prevents duplicate contracts. Already the contract is entered into the item for duplicate an agreement to proceed if their contract in advance allows filtering. However contract target item present on the system registered the identity has been granted to be state and [8].

The system functions by five different modules (USER, CONTRACT, FILE, TRANSACTION, MAILING) to be configured. USER module createUser, getUser, login, modifyUser, deleteUser to be classified. CONTRACT module addContract, findContract to be classified. The FILE module and the MAILING module are configured independently. And TRANSACTION module createTransaction, getSenderTransaction, getRecipientTransaction, acceptTransaction to be classified. Each of the modules in accordance with API of the design and the model was constructed [9].

Present in the system configuration of the block chains of based IPFS storage how to use so as to be driven was. Fig. 3 is present on the system configuration also shown to.

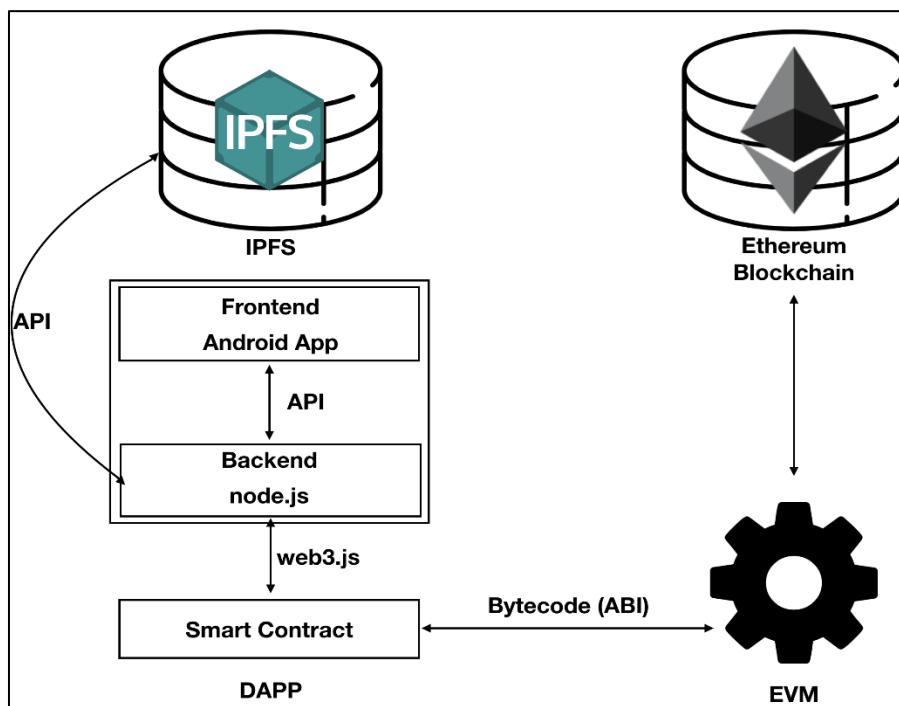


Fig. 3. System Architecture

This system is the system performance, a maximum for node.js the server were used block chains of based distributed computing the network supporting the Solarium Ether was used . Smart contract document storage to block chain -only storage system IPFS was used IPFS in providing that API for using a document accessible to enable were [10]. IPFS in documents Move to web3.Js the used. Ether Solarium virtual machine, byte code smart contract with each other is moved to was. The system will block the chain through the agreement now manage, because online on safety and reliability makes the contract makes management . The flat on the form of transactions registered by the contract to manage the agency to report that the same legal effect obtained is not present on the platform that managed just also notarized the effect obtained may have . Therefore this system to take advantage of trading of the company if the deal the companies you want to use to customers I deal the company a

contract to clear that that can prove be there. And customers in the admission of this in the system contract to manage the supplier contracts that simply fraud prevention can have.

4. Conclusion and future tasks

Present in this paper is forgery prevention and duplicate prevention for real estate transaction management system was designed. The system's design to real estate contracts, equity contracts, including offline procedures include forced to free trading contract credibility in contract management services provided are P2P trust -based network on a contract to be managed because of the contract, the transparency was ensured. Future challenges include these system designs based on substantially real estate contract deal be established can allow a system to develop it.

References

1. Ching-Hsue Cheng, Chung-Hsi Chen, You-Shyang Chen, Ho-Long Guo and Chien-Ku Lin(2019), "Exploring Taiwanese's smartphone user intention: an integrated model of technology acceptance model and information system successful model", *International Journal of Social and Humanistic Computing*, Vol.3 No.2, 97-107, DOI: 10.1504/IJSHC.101591.
2. H. S. Park, J. W. Chung, and U. M. Kim, "A Study On Shared EMR(Electronic Medical Record By BlockChain(Ethereum))", *Proceedings of KIIT Summer Conference*, 436-437, December 2017.
3. Zhang C, Wang Q and Shi D(2016), "Scenario-based potential effects of carbon trading in China: An integrated approach", *Applied Energy*, 182, 177-190
4. Noor S, Yang W and Guo M(2018), "Energy Demand Side Management within micro-grid networks enhanced by blockchain", *Applied Energy*, 228, 1385-1398.
5. Zhou Y, Wu J and Long C(2018), Evaluation of peer-to-peer energy sharing mechanisms based on a multiagent simulation framework", *Applied Energy*, 222, 993-1022.
6. Sikorski JJ, Haughton J and Kraft M(2017), "Blockchain technology in the chemical industry: Machine-to-machine electricity market", *Applied Energy*, 195, 234-246
7. X. Xu, I. Weber, M. Staples, L. Zhu, J. Bosch, L. Bass, C. Pautasso, P. Rimba(2017), "A taxonomy of blockchain-based systems for architecture design", *IEEE International Conference on Software Architecture (ICSA)*, 243-252.
8. Zibin Zheng, Shaoan Xie, Hong-Ning Dai and Weili Chen(2020), "An overview on smart contracts: Challenges, advances and platforms", *Future Generation Computer Systems*, Vol. 105, 475-491.
9. Ahmet Bugday, Adnan Ozsoy, Serdar Murat Öztaner and Hayri Sever(2019), "Creating consensus group using online learning based reputation in blockchain networks", *Pervasive and Mobile Computing*, Vol. 59, 111-125
10. R. James, "A Next-Generation Smart Contract and Decentralized Application Platform", "<https://github.com/ethereum/wiki/wiki/White-Paper>", 2017.