iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** V **Month of publication:** May 2022

DOI: https://doi.org/10.22214/ijraset.2022.42544

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue V May 2022- Available at www.ijraset.com

A Decentralized Asset Tokenization System using Ethereum

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Abstract: ***Real estate is one of the most trusted investments that people have preferred. It provides a steady source of income which can be in the form of rent as well as lease. There are a number of advantages, but one of the key disadvantages of real estate investments is illiquidity. Although the global real estate investments are twice the size of investments in the equity markets, the number of investors in the real estate market is remarkably lower. Blockchain technology has real potential to solve the issues of illiquidity and transparency, and most importantly, it opens this very market to the retail investors as well. By creating Security Tokens, which are backed by real-world assets, real estate can be made more liquid with the help of Special Purpose Vehicles. These security tokens, which represent fractional ownership of the real estate can be traded by a trader / investor and these tokens can be listed on legitimate secondary exchanges. The robustness of Smart Contracts can be very efficient in transferring of tokens and also provide a seamless distribution of earnings amongst the investors / traders. This work describes Ethereum blockchain based solutions has the potential to make the existing Real Estate investment system much more efficient and reliable.***

Keywords: Tokenization , Blockchain , Fungible Assets, Tokens, Special Purpose Vehicle, Smart Contracts, Liquidity, Security Tokens,

I. INTRODUCTION

Tokenization is an exponentially developing area in the financial industry. It enables investing in the form of digital tokens which are backed by real-world securities or assets. In the following context, we will be using “tokenization” as a general description for the process of moving traditional non-digital securities to a digital form using the blockchain technology. We will be using “Tokenized securities” to describe digital investment products with the characteristics and functions of securities. We will be using “security tokens” to describe the form in which tokenized securities are issued to the investors

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II. OBJECTIVE

To develop a transparent yet a very secure asset tokenization project using blockchain technology.
To make the overall process fast and reliable with appropriate optimizations and encryptions.

III. PROBLEM STATEMENT

A decentralized asset tokenization system using Ethereum blockchain to tokenize fungible assets anything that has a real value in the real world, and place it onto a shared ledger to represent its sole proprietary.

IV. PROPOSED SYSTEM

In this system, we are creating an asset tokenization system using Blockchain Smart Contracts to buy and sell tokens (which can be used for other fungible tokens).To get the orders from the customer end we make use of Ethereum Blockchain, NodeJS(back-end), ReactJS(front-end), and Metamask Wallet. Metamask Wallet is used for interacting with Ethereum Blockchain and for transactions done in the system. On the seller end where seller accepts order and updates the detail through NodeJS backend and sends it into the database that is Blockchain for storage and it cannot be changed. The seller updates the database at each step from accepting the order until the delivery. This whole process is automated with the Smart Contracts. Written in solidity, they provide a trustless system with incurring some costs called gas cost. Here we are specifically using ERC20 Smart Contracts from OpenZeppelin (open source) for additional security and KYC purpose. For testing and development purposes we are using Ganache and for deploying we are using Infura.

V. SOFTWARE AND HARDWARE REQUIREMENTS

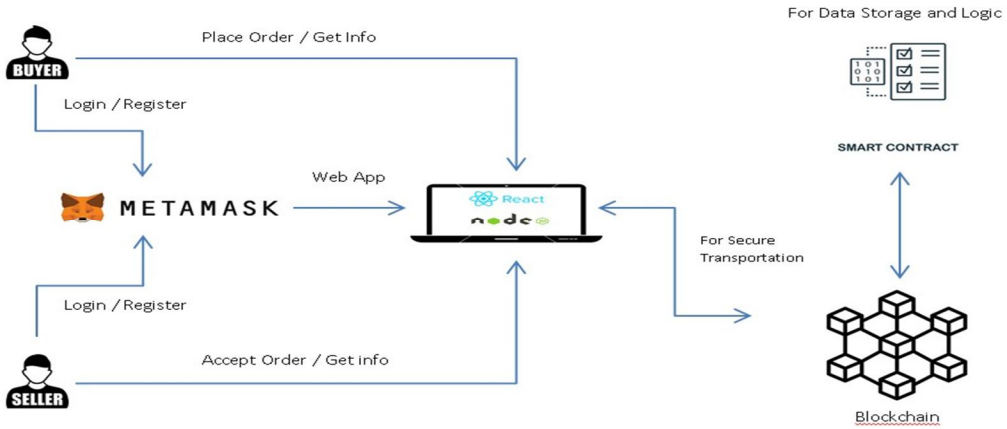
Ethereum Blockchain, Remix IDE, Metamask, Ganache , Solidity, Open Zeppelin, Truffle, Web3.js library, ReactJS, NodeJs

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VI. METHODOLOGY/ALGORITHM

Proof of Work (PoW). : In Blockchain, this algorithm is used to confirm transactions and produce new blocks to the chain. With PoW, miners compete against each other to complete transactions on the network and get rewarded. In a network users send each other digital tokens. A decentralized ledger gathers all the transactions into blocks.

VII. SYSTEM ARCHITECTURE



VIII. ADVANTAGES

A. Fractionalization

For assets that traditionally have a large upfront capital requirements, tokenization lowers the bar to enter for investment by enabling interests in the asset to be more readily divided across a wider pool of investors. New financial products could be distributed to a wider range of investors at a lower price per unit.

B. Operational Efficiency

Smart contracts are programmed actions on the blockchain technology that helps with the automation of processes such as compliance checks, investor whitelisting, and post-issuance matters including dividend distribution. Smart contracts also enable the programming of tokens with unique qualities, such that the characteristics of each share class and customizable fee structures could be created for tokenized assets at a relatively low operational cost.

C. Reduced Settlement Time

Transactions in tokenized products can be settled instantaneously, unlike the traditionally required days or weeks that it can sometimes take to settle such financial transactions.

D. Data Transparency

Blockchain as a distributed ledger technology is known for its immutability and is very immune to cyber-attacks, as data is distributed across a network of participating nodes as opposed to a single centralized database. While transaction details are made trackable and visible on blockchain, data anonymity of blockchain transactions are preserved by cryptographic hashes.

E. Flexibility

Fractionalization enables flexible portfolio construction and diversification.

F. Liquidity

Tokenization enables liquidity by enabling the secure transfer of shares between investors, with every transaction being reflected on the digital ROM. With regulatory regimes, worldwide embracing, and establishing frameworks for the regulation of digital securities exchanges, global public market. Liquidity for tokenized securities is also not very far from the present.

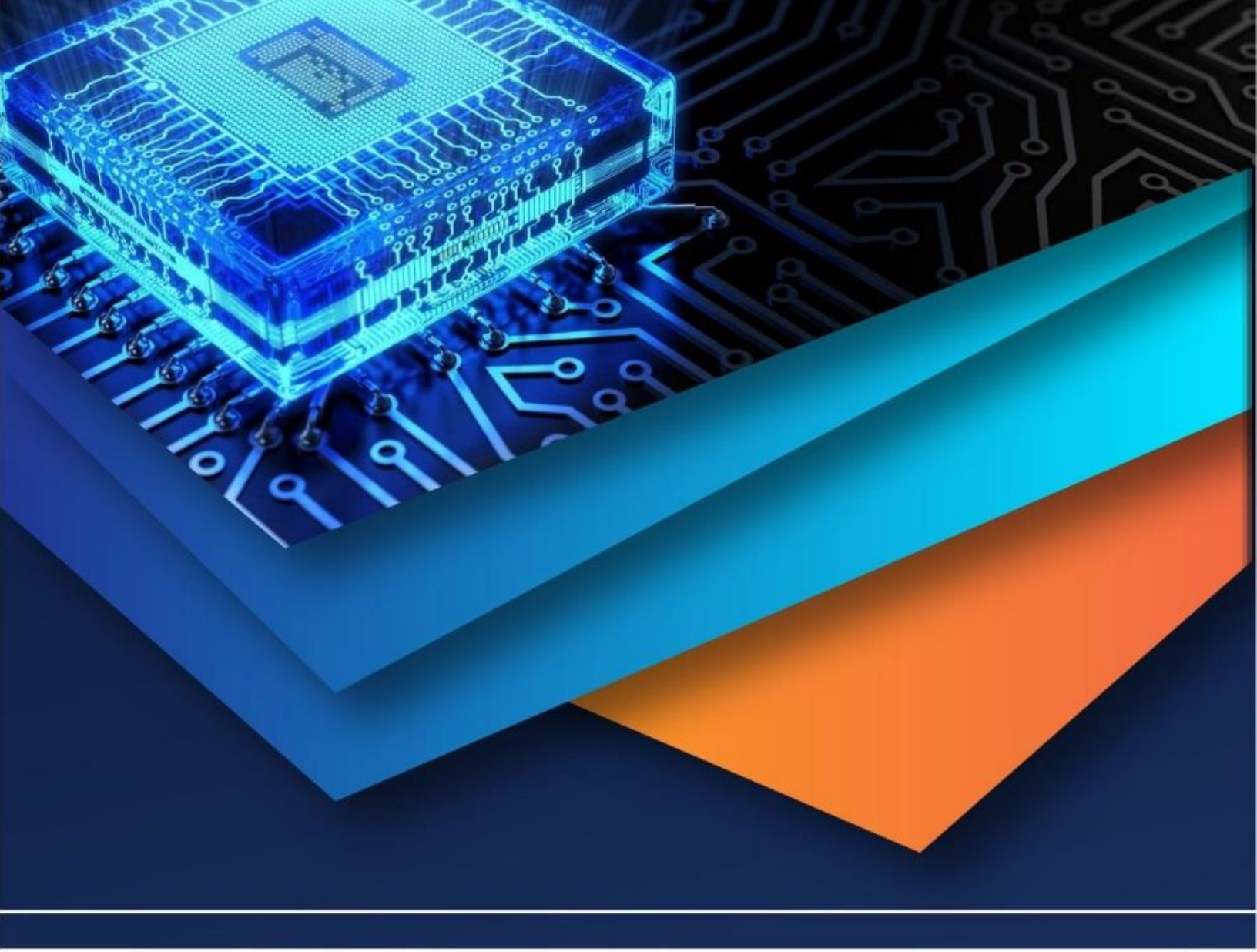
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IX. CONCLUSION AND FUTURE WORK

Tokenization is an interesting phenomenon with the potential to change the entire asset industry. The most central benefits are fractionalization, efficiency in the transaction process, less required capital for direct capital investment. This also increases liquidity in large capital investments. Through blockchain and smart contracts, transfers of dividend and ownership are automatically executed. But tokenization may cause a situation with lack of management due to several owners of the same property. The efficiency of blockchain might be reduced upon increase in the number of users of the system. To conclude, tokenization has a great potential to revolutionize the market, but the cons of the system exceed the pros to date. The success of this system depends entirely on the global sentiments and views towards blockchain technology.

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