



# Use Case: Smart Contract for Lease Agreements using Blockchain Technology

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**Abstract** -A blockchain Technology is a peer to peer distributed ledger counterfeit by consensus, combined with a system for smart contracts. Its uses peer to peer network architecture to connect each other, without a central authority. Blockchain has established from many industries, researchers and government bodies. This paper aims to present the Blockchain and smart contract for a specific domain which deals with real estate for solving issues like avoiding Third-parties, Brokerage service, Trusty Transaction, Settlement in between landlord and Tenant, etc. A complete overview and designing of Decentralized application with smart contract is obtainable and then implementing use case for leasing/ renting residential and business buildings is examined.

**Keywords:** Blockchain, Ethereum, Smart Contract, Dapp[decentralized application], Lease/ Rental Agreement, estate.

## I. INTRODUCTION

In the recent year 2017, a cryptocurrency called bitcoin booms in the Market by increasing the assert value on public interest because of Blockchain technology. The Blockchain is a FINTECH disruptive technology based on cryptography. It has been known of the work of Satoshi Nakamoto<sup>[1]</sup> in 2008 who Proposed white Paper about this technology can become the major core component to maintain transactions of the digital currency namely bitcoin<sup>[2]</sup>. With this introduction of Blockchain applied, many fields such as Banking, Education, Finance Sector, and Clayming Insurance sector, Health Sector, accounting, and real estate will receive a positive impact using the benefits of this technology. On Interesting area in which blockchain technology could play a vital role in estate for Leasing a Properties like lands, Houses, Agriculture acres, Buildings, farms, etc without Third party services or avoiding middleman. Globally, real estate is undergoing a major evolution and transformation towards Society. Industries are being developed and a plethora of network, services, and transactions are integrated into the metropolitan planning initially and daily use. It is anticipated that the evolution of technology, not only improves life also maintain time Management, for example The tenants or The office workers, but also enhances building performance and sustainable energy.

The Blockchain is known to be the distributed peer-to-peer (P2P) public ledger for all transactions, eliminating the need

of trust between the users and the central authority and Governance, so control is distributed among different computers/nodes in the P2P network. Moreover, the Blockchain resolved the double-spend problem using P2P technology in combination with public/private key cryptography.

Dr. Zhao,et al.<sup>[3]</sup> defined the Blockchain as “a distributed database comprising records of transactions that are shared among participating parties”.

According to Deloitte<sup>[2],[4]</sup>, Blockchain is “just another type of database for recording transactions-one that is copied to all computers in a participating network”.

Blockchain by definition is a connection of blocks of information about that transaction records using cryptography. Each Block contains a cryptographic hash of the Nonce (Unique value), previous block Hash, a timestamp Creation, and transaction data (generally represented as a Merkle tree and consecutively widely published with a unique symbol. Transactions are inserted in the chain of blocks, and each block is composed by a unique hash function (alphanumeric string resulting from coding data with cryptographic private and public keys), a nonce (a unique number or arbitrary constant value to the block) and by a hash function from the previous block. The first block is called genesis block or block 0 which contains set of protocol like Configuration, Difficulty, Gas Limit, allocation, etc, instructions used by miner to solve puzzle to

get Rewards. This makes the mechanism safe and secure from attempts to change a transaction. Many people and researchers believe that blockchain applications in different with other application and industries could lead to three generations of the Blockchain, namely,

1. **Blockchain-1.0:** The decentralization crypto-currency for making digital payments using Bitcoins.
2. **Blockchain-2.0:** Addition to Blockchain 1.0 we can able to Merge smart contracts (Solidity code) along with crypto-currency called Ethers. Finally we can develop Dapp.
3. **Blockchain-3.0:** it's a decentralization applications emerging with different domains, Example: Machine Learning, Artificial Intelligence, Internet of things (IoT), health Sector and government entities.

This paper discussed about Detail Explanation of Blockchain, implementation of Dapp along with smart contract of leasing agreement in real estate domain with Blockchain technology applied.

## II. PROPOSED WORK

We Evaluated and design blueprint with implementation of smart contract which leads to be predict and authorize development with implement stage of Real estate's agreements which includes different types of phrases under Lease Agreements with a single smart contract we can give a lease to our Properties (lands, Houses, Agriculture acres, Buildings, farms, etc.) to any landlord and tenants using Blockchain technology without any middle-man. As the Frauds are increased by day-to-day there will be no trust on Middle-man, to avoid this Blockchain will helps to overcome with this problem. We are elaborated and researched on Blockchain Technology is suitable for Lease Agreement which is designed with solidity smart contract and creating Dapp for finite number of functions described for a specific use case. In this framework, the blockchain helps to provide eco-friendly with go-green along with decreases paper base environment into web based transactions, with high level secure approach for optimizing assets in Lease Agreement. This proposed experiment, the solidity smart contract helps to provide solution to save Brokerage charges, trustness, reducing middleman in distributed and decentralized public ledger and storing all this transactions in a blockchain logs file in between landlord and tenants.

## III. BACKGROUND & RESEARCH METHODOLOGY

1. This section presents general background information about blockchain and smart contracts technologies.
2. It also discusses some blockchain platforms that support the development of smart contracts. Finally, it provides some potential use cases for smart contracts.

This section illustrate common background information about types of blockchain and Ethereum smart contracts technologies. It also identifies some applications in blockchain platform which will helps to design some applications by using smart contracts. Finally, it produces some generalized use cases of leasing agreement for Landlords and Tenants by using smart contract Ethereum applications.

### 3.1 Building Trust with Blockchain

Blockchain enhances trust across a business network. It had unique future like decentralized and distributed peer-to-peer (P2P) network, which innovates in digital Technology using advance algorithms. There are five major attributes in blockchain which builds trust as following:

- **Distributed:** Every incoming transaction in a block is shared and updated all among in the nodes connected in P2P distributed Blockchain ledgering system. This is done with no central server or database controlling among.
- **Secure:** There is no unauthorized access to Blockchain made possible through Permissions and Cryptography.
- **Transparent:** All node or participant can access all transaction data in Blockchain. Every miners have list of transactions to validate by solving puzzle and miners themselves can verify the identities without the need for mediators.
- **Consensus-based:** All participants in the network must be agreeing that a transaction is valid by reaching set of protocols in their consensus algorithms.
- **Flexible:** Smart Contracts can compile with Ethereum Virtual Machine (EVM) which are executed by calculating gas price based on certain conditions can be written into the platform. According to user flexibility transactions can make fast by increasing gas unit.

### 3.2 Blockchain Technology with Bitcoin and Ethereum

A blockchain is a distributed database that records all transactions that have ever occurred in the blockchain network. This database is replicated and shared among the network's participants. The main feature of blockchain is that it allows untrusted participants to communicate and send transactions between each other in a secure way without the need of a trusted third party.

Blockchain is an ordered list of blocks, where each block is identified by its cryptographic hash. Each block references the block that came before it, resulting in a chain of blocks. Each block consists of a set of transactions. Once a block is created and appended to the blockchain, the transactions in that block cannot be changed or reverted. This is to ensure the integrity of the transactions and to prevent double-spending problem.

Cryptocurrencies have emerged as the first generation of blockchain technology.

Cryptocurrencies are basically digital currencies that are based on cryptographic techniques and peer-to-peer network. The first and most popular example of cryptocurrencies is Bitcoin. Bitcoin [3] is an electronic payment system that allows two untrusted parties to transact digital money with each other in a secure manner without going through a middleman (e.g., a bank).

Transactions that occurred in the network are verified by special nodes (called miners). Verifying a transaction means checking the sender and the content of the transaction. Miners generate a new block of transactions after solving a mathematical puzzle (called Proof of Work) and then propagate that block to the network. Other nodes in the network can validate the correctness of the generated block and only build upon it if it was generated correctly. However, Bitcoin has limited programming capabilities to support complex transactions. Bitcoin, thus, does not support the creation of complex distributed applications on top of it.

Other blockchains such as Ethereum have emerged as the second generation of blockchain to allow building complex distributed applications beyond the cryptocurrencies. Smart contracts, which will be discussed in the following section, are considered as the main element of this generation [4]. Ethereum blockchain is the most popular blockchain for developing smart contracts. Ethereum is a public blockchain with a built-in Turing-complete language to allow writing any smart contract and decentralised application.

All transaction in a blockchain is recorded in a distributed database is immutable cannot be altered retroactively in the blockchain network. This transaction database is replicated and shared all among the network's participants. The main Outline of blockchain is that it allows untrusted participants (anonymous) P2P to communicate and send transactions between each other in a secure way without the need of a trusted third party(Middle man). All transaction in Blocks are arranged in a chronological order in a Blockchain. Every block is identified by its cryptographic hash function. Each block references the block that came before it, resulting in a chain of blocks. Each block consists of a set of transactions. Once a block is created and attached to the blockchain, all transactions in that block cannot be modified changed or reverted because of Tampered proof. This is to ensure the integrity of the transactions and to prevent double-spending problem. Cryptocurrencies have emerged as the first generation of blockchain technology. Crypto currencies like Bitcoin, Ether, Litecoin, Bitcoin NG, etc are basically digital currencies that are based on cryptographic techniques and peer-to-peer network. The first and most popular example of cryptocurrencies is Bitcoin<sup>[1]</sup>. Bitcoin is an electronic

payment system that allows to transfer digital money with each other in a secure manner without going through a middleman (e.g., a bank). Transactions that occurred in the network are verified by special nodes (called miners). All the transactions in a block is verified by a Miner by solving a puzzle called Proof-of-Work (POW). After solving mathematical puzzle POW, Miners can be generate a new block with set of transactions and propagate in Blockchain network. The First who solves this puzzle will be included in the network, Remaining nodes who's able to solves puzzle can be referred as stale block which can side linking with same block for reference but they will not get rewarded in blockchain. Other hands, Bitcoin had limited properties to handle Transactions and its does not have capabilities to support programming to perform automatic self-transactions. Hence, Bitcoin cannot support computerized self-transaction itself and unable to create complex distributed applications on top of it. Perhaps there is a another blockchains called Ethereum which emerged as the second generation of blockchain to allow building complex distributed applications(Dapp) beyond the cryptocurrencies. We can write computerized Smart contracts (code), can be briefly discussed in next section. Ethereum<sup>[6]</sup> blockchain is the second generation of blockchain for developing Distributed application with smart contracts were it can perform self-transaction without human interface. Ethereum is a public blockchain written with complete Turing language to allow compile, writing and debug the code and its coding style can be read-able by human.

### 3.2 Smart Contract

Smart contracts were first proposed by Nick Szabo<sup>[7]</sup> which implements on blockchains<sup>[2]</sup>. Smart contract is a kind of computer program is mostly used in blockchain distributed ledger used for by the Ethereum Foundation<sup>[6]</sup> or simply IBM<sup>[8]</sup>.

In 2018, a US Senate report said: "While smart contracts might sound new, the concept is rooted in basic contract law. Usually, the judicial system adjudicates contractual disputes and enforces terms, but it is also common to have another arbitration method, especially for international transactions. With smart contracts, a program enforces the contract built into the code."<sup>[9]</sup>By implementing the Decree on Development of Digital Economy", Belarus has become the first-ever country to legalize smart contracts. Belarusian lawyer Denis Aleinikov is considered to be the author of art contract legal concept introduced by the decree<sup>[9][10]</sup>.

### 3.3 Application of Smart Contract

**Supply Chain<sup>[11]</sup>** : Blockchain can be applied to many challenges of the Supply Chain industry such as complicated record keeping and tracking of products. As a less corruptible and better-automated alternative to centralized databases. It will lead to fewer counterfeiters and ensured

safety in the processes it will also allow manufacturers, transporters, and end-users to collect data, study trends, and apply predictive monitoring process for better product experience.

**E-commerce:** Online Shopping is a wide potential use case where Transaction is done between seller and buyer without a knowing each other and not verifying distributor is Transfer original product or not, hence it can be place-able by duplicate products instead of original. Once product release we cannot know its strategy of product is original/duplicate until its Delivery at home, if we use blockchain technology the packing product can be Traceable the History about Manufacture, licenses, Warranty etc., without third party involveme

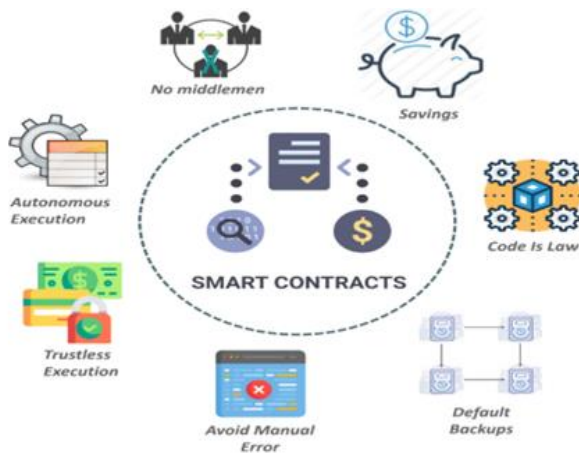


Figure 1: Smart contract system

We can avoid return backing the product along with we receiving original products also we can reduce the trading cost of resending. While using Smart contracts have advantage to hold payments until if you receive original product only we can release the payment to the seller once the buyer is satisfied with the product received.

**Music rights management**<sup>[12]</sup>: Impending use case is to record the ownership rights of a music in the blockchain. A smart contract can implement the payment for music owners once music is used for commercial purposes. It also ensures the payment is being distributed between the music's owners. UJO is a company that investigates the use of blockchain-based smart contracts in the music industry.

**IV. IMPLEMENTATION PHASE OF BLOCKCHAIN APPLICATION**

For the design and implementation of the Blockchain applications the following phases such as Planning, Define Requirements, Design & Prototyping, Software Development, Testing and Deploying are presented in the following.

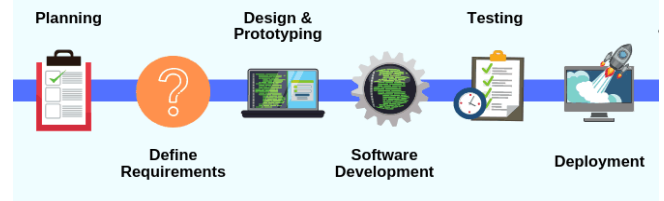


Figure 2: Development phases for blockchain applications

The Planning Phase describing about scope of this Project which “avoiding Third-parties, Brokerage service, Trusty Transaction, Settlement in between landlord and Tenant, etc” and the main purpose of this application is to provide Transparency between landlord and Tenant without Middle-man.

In the Define phase, the application is supposed for Real estate’s which solves day-to-day era. This model contains entity attributes as state variables and interactions between them as functions. In addition, we captured the constraints and dependencies.

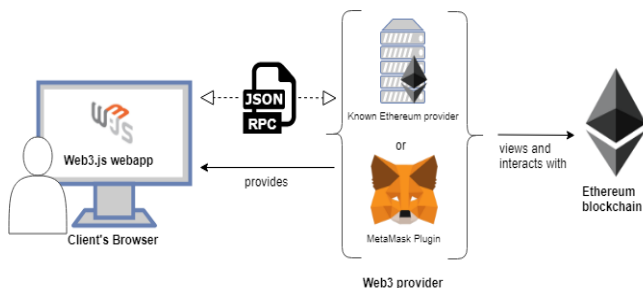
In Design & Prototyping Phase, we implement the smart contract for the blockchain applications using high-level programming language Solidity. The key components of the smart contract are state variables, functions, modifiers, and events. Finally we have to created DApp using Ethereum platform using Truffle suite Framework. which consists Web-application(Front-end) html, css, Bootstrap. Deployed using Ethereum Blockchain network using Ethereum clients with private network like Ropsten network, Rinkeby network, local networks (TestRPC, Ganache).

In Software development phase, we can use an Access Control or Source Code Management applications to reach target goals are being met. The coding process includes many other tasks like Front-end, Back-end, Finding and fixing errors and glitches, troubleshooting etc., In Testing Phase, Truffle uses the Mocha testing framework and Chai for assertions to provided with a solid framework from which to write your JavaScript tests and asset pipeline for blockchains using the Ethereum Virtual Machine (EVM) which contains automated compilation.

Final phase is Deploying/ linking Dapp using public or private Blockchain networks. A Public Blockchain is a permissionless blockchain like Bitcoin, Ethereum, Litecoin, etc. Anyone can join the blockchain network, meaning that they can read, write, or participate with a public blockchain. Public blockchains are decentralised, no one has control over the network, and they are securing in that the data can’t be changed once validated on the blockchain its Tampered proof. On the other hand, a Private Blockchain like Hyperledger, Hashgraph, Corda, etc. is a permissioned blockchain networks place restrictions on who is allowed to participate in the network and in what transactions.

**4.1 Decentralized Applications (DApps):**

A Decentralized Application (DApp) is an application that uses smart contracts as a user friendly interface with blockchain. A typical DApp is a cryptocurrency (Ethers) application that runs on a Ethereum permissionless Blockchain network. A Decentralized application structure is composed by a front-end interface (Web Browser, HTML, CSS, Bootstrap), Web Browser connects MetaMask is a bridge that allows to run Ethereum dApps and a back-end interface (Web3.js, JavaScript) by using JSON RPC procedure calls. As described in **Figure3**, The DApp application interacts with the Ethereum node (EVM) using JSON RPC as a stateless and lightweight remote procedure call (RPC) protocol that is used by Ethereum clients to interact with an Ethereum node.



**Figure 3: DApp Structure**

**4.2 System Architecture**

System Architecture defines complete Dapp creation using Ethereum Blockchain. Web application (Front-end) that interact with the smart contract users (landlord/real estate owner and tenants) and its deployed in Ganache Network which describes below and DApp Creation required following software Requirement:

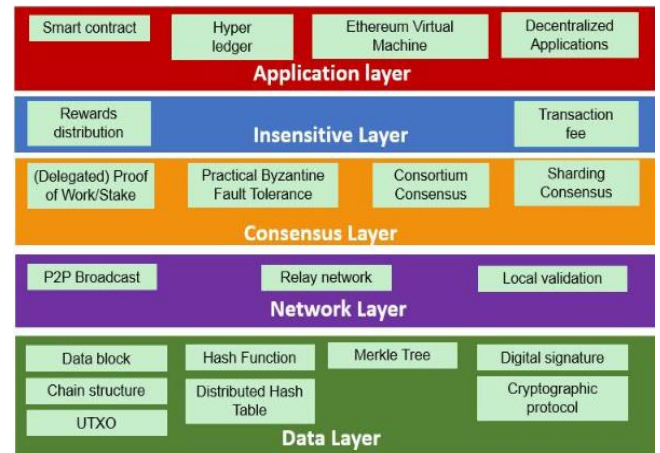
**Truffle-Framework:** Truffle is made for building dApps using the Ethereum Virtual Machine (EVM) by providing a development environment, testing framework, and asset pipeline. It's a bundle of frontend, smart contracts, web3js, javascript, Migration into Ganache Blockchain.

- **Web application (Front-end):** Designing with Html, CSS, Bootstrap
- **Application Layer:** Smart contracts is Written with Solidity Programming Language
- **EVM:** It's a sandboxed virtual stack embedded within each full Ethereum node, responsible for executing contract bytecode.
- **Javascript & web3js:** User Interaction with Front-end with solidity smart contract.

**4.3 Dapp Framework:**

Truffle Suite is a development environment based on Ethereum Blockchain, used to develop DApps (Distributed Applications). Truffle is a one-stop solution for building DApps: Compiling Contracts, Deploying Contracts,

Injecting it into a web app, Creating front-end for DApps and Testing.



**Figure 4: Blockchain System Architecture**

Truffle Suite has three components:

- 1. Truffle:** It is a Development Environment, Testing Framework and Asset pipeline for Ethereum Blockchains. Its Feature listed below:
  - Built-in smart contract compilation, linking, deployment and binary management.
  - Scriptable, extensible deployment & migrations framework.
  - Network management for deploying to any number of public & private networks.
  - Automated contract testing for rapid development.
- 2. Ganache :** Ganache is a personal Ethereum Blockchain used to test smart contracts where you can deploy contracts, develop applications, run tests and perform other tasks without any cost and allows developers to create smart contracts, dApps, and testing software in desktop application and command-line tool for Windows, Mac, and Linux.
- 3. Metamask:** MetaMask is a browser plugin, available as the MetaMask Chrome extension or Firefox Add-on. At its core, it serves as an Ethereum wallet: By installing it, you will get access to a unique Ethereum public address, with which you can start sending and receiving ether or tokens.

In **Figure 5**, Dapp Framework consisting Entire project setup with Lease Agreement which contains both Front end & back ends. The Blockchain users can be invoke this Dapp with Web Browser and they can able read contract, if anyone interested they can take a lease, the users can able to see location of the property. If the Term period of lease completed they can be Renew or they can be Terminate contract. Each and Every Transaction is recorded in blockchain Network.

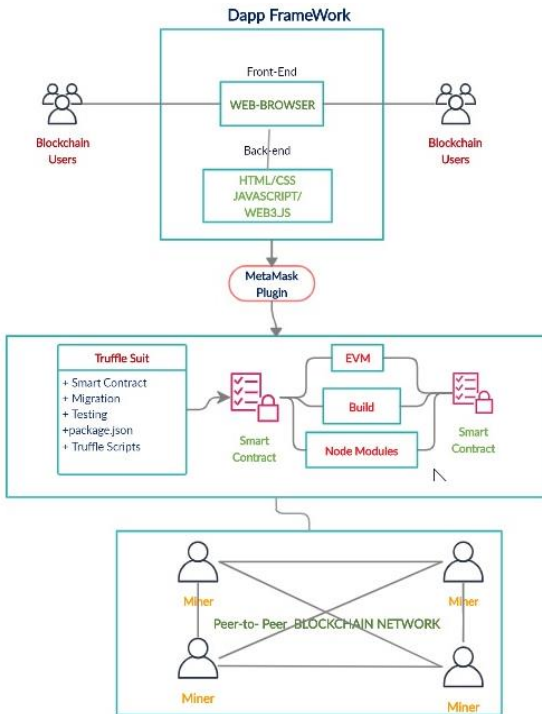


Figure 5: Dapp Framework

V. SMART CONTRACT FOR LEASE AGREEMENT IN DESIGN PHASE

The Smart Contract is online software for independent landlords or property managers to manage the cashflow of their property portfolios. The innovation this technology brings is the automation of many cashflow duties by using a system of 'smart contracts'.

The benefits are:

- Less time spent reconciling cashflow transactions for rent payments and property expenses.
- Full transparency and control for overseeing and approving property expenses.
- A reduction in accounting, compliance and property management costs.

In **Figure6** implementation of Smart contract for Lease/Rental Agreement as shown, which represents public address of both owner and tenant, visibility of public can anyone able to see this contract Agreement between Landlords. We can able to locate the Address along with Google Mapping with Location maps. The Tenant can be make an agreement with owner by paying rent amount with providing necessary information, then all the Transaction is recorded in Blockchain network along with Timestamp. Lease function invoke with Tenant where he can makes agreement with owner by paying rent. Once the contract Terms Completed the owner can able to Terminate Contract lease.

The key features this technology delivers are:

**Security Bond Deposit** - Funds are been secured at deployed contract in blockchain account to reach consensus of lease term. Funds are release upon fulfilling their conditions then signing dual by tenant and landlord with any deductions paid to the landlord as agreed by both parties.

```

//Smart Contract for Lease Agreements
pragma solidity ^0.5.11;
contract Agreement
{
    address payable public owner; //owner address
    address public tenant; //Tenant address
    uint public rentcost; //Rent Amount
    string public houseloc; //Rental Location
    uint public createdTimestamp; //Agreement Created Time with Date
    uint public Tpaid; // Amount Paid by tenant

    constructor() public {
        owner = msg.sender;
        createdTimestamp = block.timestamp;
        houseloc="Narayanguda";
        rentcost=10;
    }

    function lease(address _t) public payable //invokes Tenant Takes lease
    {
        tenant = _t;
        Tpaid= msg.value;
    }
    event Tenant(address tenant, uint Tpaid);

    function getTenant() public view returns (address)
    {
        return tenant;
    }

    function TerminateContract() public
    {
        require(owner==msg.sender);
        owner.transfer(address(this).balance);
    }
}
//Main Loop
    
```

Figure 6: Smart Contract for Lease Agreement

**Reconciliation Tenancy Ledger** - Revenue from rent deposits are automatically reconciled with the tenancy ledger. This means that bank statements do not need to be imported into our software to verify that rent has been paid on time.

**Expense Management** - Property maintenance and ad-hoc expenses are be paid via rent revenue or the tenant's bond deposit.

At the compassion world of technology the smart contract can replaces the traditional tenancy agreement between a landlord and tenant and we can have paper-less proof. Unlike a traditional contract, it is digitally signed by both parties and published on the blockchain. Once published, it is activated and executes transactions using a payments bridge (Metamask) to control the flow of funds between two entity accounts, as specified in the terms of the contract.

The smart contract is self-programmed funds Transfer between tenant and owner in either form of a depositing an advance payment or paying annually at a time or monthly based payment is direct debit automatically for tenant and

deposit in owner account. If the transaction is a bond payment then the smart contract will hold these funds until the termination of the lease. If the transaction is a rent payment then the smart contract will automatically reconcile these transactions with the tenancy ledger and disburse the funds to the appropriate account.

**5.1 Creating a Tenancy Contract**

The customer deeds between a landlord and tenant for creating a new Smart Contract is as follows:

1. Landlord creates a Smart contract with the key attributes of the tenancy such as property details, Location, and rent amount.
2. Tenant is notified and can be reviews the terms of contract, which can be seen in a traditional legal format as they would when reviewing any other usual tenancy agreement.
3. Tenant agrees those terms, which they can accept by digitally signing the contract using a digital key that represents their identity. If this is the tenants first time, then they must follow step 4.

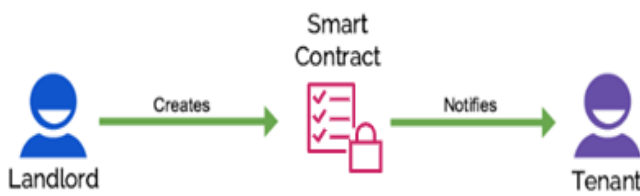


Figure 7: Notifies Terms & conditions

4. Complete registration in order to receive their digital key. Registration involves completing an identity check.
- 5.

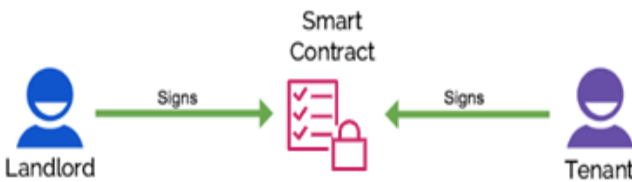


Figure 8: Both Landlord & Tenant signing Smart contract

6. Landlord also signs the contract which now becomes a lawfully required digital document published on the Blockchain.

**5.2 The Flow of Funds**

The following describes the flow of funds that is controlled by the Smart Contract.

1. The Smart Contract debits the tenant's account every month/every year or annually. The funds are right away dispersed to the landlord's account. In the case where there

is an exceptional invoice that needs to be paid for any property related work such as maintenance of ad-hoc repairs performed by a third party, then the smart contract allocates a proportion of the month's rent to settle the invoice.

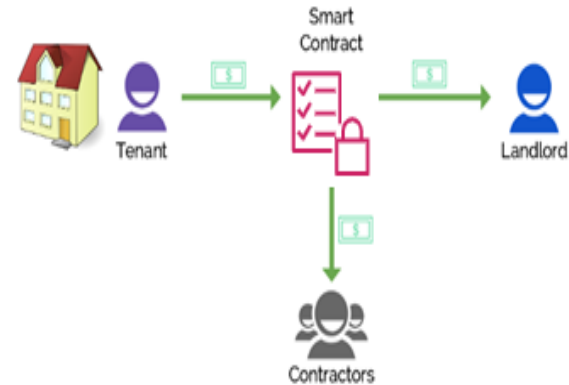


Figure 9: Paying Lease cost to owner

2. A head termination of the lease the tenant's deposit is disbursed to the tenant and landlord according to what has been agreed between both parties to cover any damages or other expenses.

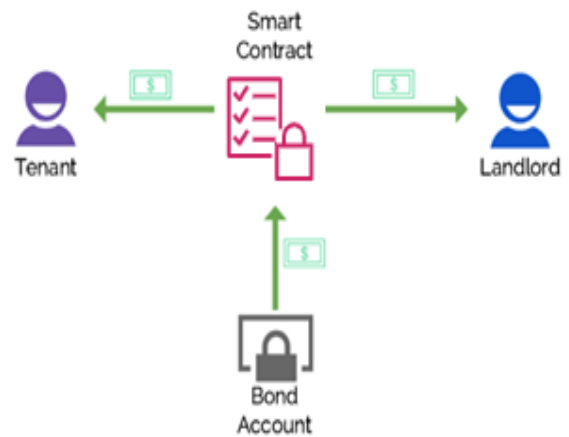


Figure 10: Settlement in between two parties

**VI. IMPIMENTATION PHASE**

In the implementation phase, the code programming for the smart contract is started using Solidity programming language along with Truffle suite Framework. The following gives a User Interface (UI) implementation Idea of the Real estate's Agreement. Working Dapp can be avail in my github/shankermjj Repository. Font end designed with Bootstrap which navigates to web3.js file with RPC protocols communicate with smart contracts. The following figures describe the State Variables, Functions, Modifier, Events used in Smart contract.

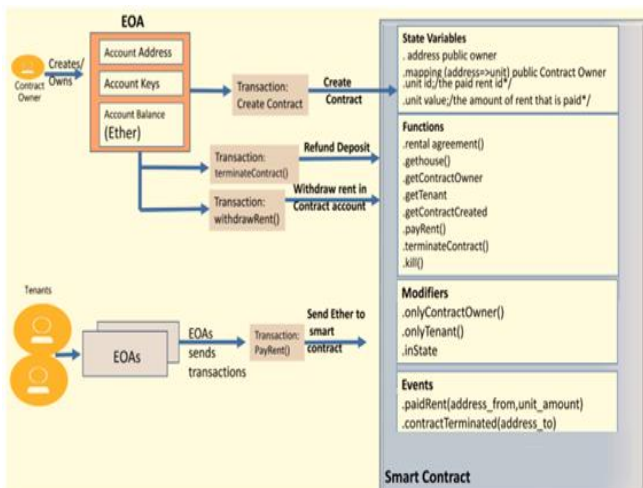


Figure 11: Smart contract Implementation of Lease Agreement

The problem statement of Lease agreement using centralized system can be overcome with Blockchain Technology, Figure 14 is a sample screenshot for Lease Agreement which is designed and developed with Truffle suite Framework. we designed this working model for Landlords & Tenants can able to use this project and we kept in an open source, that everyone can able to access and use.

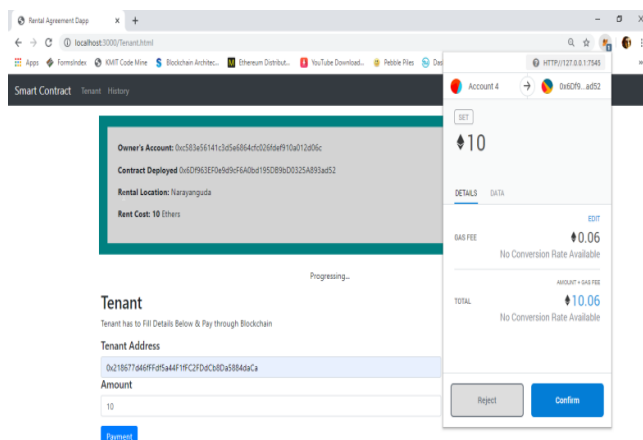


Figure 12: Working Dapp of Lease Agreement using Truffle Framework

VII. CONCLUSION & FUTURE WORK

This paper has presented an overview of the Blockchain technology as a Fintech technology in real estate industry. This study on smart contract was deliberate and determines various components in rental agreement with Landlords and Tenants. Real Estate is Future development process to avoid middle-man, Brokerage charges and Trust anyone can access with Blockchain. For the embracing of Blockchain into certain organization, it is important to meet firm requirements in order to improve the efficiency of the

current processes. The cost/benefits analysis should be prepared we ready with blockchain technology. The benefits of using smart contract and blockchain technology for real estate are as follows:

- **Un-Secured database with centralized:** In the real estate ecosystem, multiple parties such as owners, tenants, and financial management (FM) operators involve the management of real estate properties. They have access to modify a variety of information with the Blockchain. This eliminates the modification between the parties, if we use blockchain.
- **Trustless between Landlords and Tenants:** As the Technology Booming, The real estate might me untrust between entites, because of Frauds. Thus, this might increase the lack of trust.
- **Advantage of Landlords and Tenants:** By using Blockchain Technology, there are trusted between the parties such as notary and brokers are not required since the transactions can be independently verified and automatically validated in the block.
- **Mining Transaction benefits:** In real estate industry, different transactions related to different parties (such as landlords, tenants and FM services) are part of the same database. The real estate industry faces difficulties to separate the number of invoices even to file income Tax. With the Blockchain technology, we can separate transactions between the parties attempting to improve the efficiency of the invoicing with tax process. As an example, in the lease structure (lands, Houses, Agriculture acres, Buildings, farms), the tenant pays the facility services (such as cooling and maintenance services) directly deposited to the FM companies and the base rent amount directly to the landlord.

A state finite function and process work is presented in details. Future work needs to evaluate with permissioned blockchain using IBM Hyperledger Fabric.

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