Real Estate Use Case

Use Case Focus Areas

Financial-Settlement Speed, Payment Automation, Contract Enforceability, Dispute Reduction, Cash Flow Improvements

Expense Reduction-Legal, Payment Automation, Dispute Reduction, Cash Flow Improvements

Reputation-Settlement Speed, Legal, Contract Enforceability, Dispute Reduction, Cash Flow Improvements

Blockchain-Background

Blockchain is a cloud-based, distributed/decentralized ledger network that can securely store any type of data. Think documents, pictures, signatures, electronic transactions, etc. It is decentralized in that data is stored across it in such a way that no single entity controls or owns the network. Instead of a centralized, "monolithic" control structure, think about a cloud-based network where data is stored in a cryptographic method across multiple nodes.

Blockchains can support many different types of financial and business processes and can be designed in many shapes and sizes based on different set of characteristics. They can be public (see Crypto-currencies), hybrid (see Quorum https://www.jpmorgan.com/global/Quorum) or be Private/Permissioned.

- Public-Current crypto-currencies like Bitcoin, Ether, etc. run on a public blockchain models.
- Hybrid-Typically aligned to a consortium or set of federated "actors" where only an authorized set of accredited nodes are permitted to endorse the validity of transactions within the blockchain.
- Private/Permissioned-Have permissioned-base authentication mechanisms built-in, which means that "actors" must be identified and authorized in order to use the system. Typically, this authorization uses "two factor" authentication in addition to other levels of security to authorize the "actors" access to the network as well as comply with various business or financial rules and regulations that might be specific to your company, state, region or country.

For this real estate discussion, the characteristics of a permissioned blockchain network are being shared:

- Immutability-Cryptographic security featuring the SHA 256 hashing process ensures that data stored in the blockchain is virtually unrecognizable to anyone without specific authentication to access that data. Since every element stored has a "date and time" stamp, you can refer to these items as being "one source of the truth."
- Design-A decentralized network means that there is no central point of failure in the system. This means the blockchain is significantly more durable than centralized systems in terms of being able to withstand a range of critical events from malicious network attacks to power outages to bad data.

- Transparency-Transactions can be visible and traceable to all authorized "actors." That's the beauty of the network. There is nothing to hide. Signatories can grant permission to access the information in any transaction.
- Permissioned-Authorized participants have the highest degree of confidence in that they have a complete and unaltered history of all activity. As a benefit, settlements can occur with a significantly lower level risk of fraud than in other traditional systems.
- Reliability-The network is a highly reliable system as it has a very high level of redundancy due to its distributed architecture. Any infrastructure failure of any particular node or group of nodes will not compromise the blockchain's processing capabilities.
- Data Quality-By design, blockchain data has the highest level of quality in terms of completeness, validity, consistency and accuracy.
- Consensus-Consensus algorithms define the rules of how data flows and is stored on the blockchain. Nodes, or members of the network are obliged to comply with the protocol or they will be unable to contribute new transactions to the blockchain. Any malicious activity can be tracked back to the corresponding entity.

Blockchain-Application within Real Estate

Transaction Registration-By creating a blockchain-based ecosystem for residential and commercial property, transactional and registry functions can be tracked and recorded in real-time. Land titles, mortgage registrations, tenancy and escrow arrangements are some examples of transactions that can be tracked and traced.

Smart Contracts-Application within Real Estate

Settlement Facilitation-Smart contracts have advantages over traditional contracts as they remove various human elements and legacy technology. The result is a near instantaneous settlement time, a reduction in legal, accounting and transaction costs and a significant reduction in fraud, corruption and credit risk.

A smart contract is a "hard coded" computer program. It can be a coded representation of the mutual agreements contained in a traditional real estate contract as lines of software code that self-execute and manage. It has the power to move funds between bank accounts, transfer property titles, reconcile payments. If needed, smart contracts can be converted to a traditional contract form for legal purposes if required by your company, state, region or country.

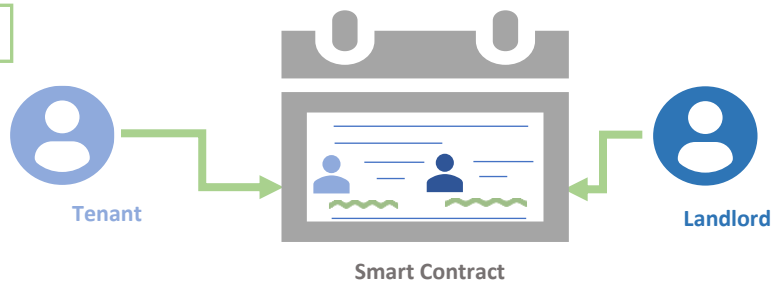
The advantages of a smart contact over a traditional contract are:

- Trustless-Being "hard coded", a smart contract executes the source code as designed. This allows one "actor" to confidently complete transactions with another "actor" without the need of a third party. The Smart contract can remove friction in traditional processes, creating efficiency, lower costs and increasing integrity.
- Autonomous- Designated smart contracts can exist on a permissioned blockchain where it will self-execute according to the pre-agreed contract conditions without any direct human involvement.
- Self-sufficient-Smart contracts can be stored on a blockchain where the "actors" can access all their resources permanently. Once published to the "actors", a contract becomes irrefutable, irreversible and unalterable. This means that all "actors" who participate have a very high confidence in execution of the process defined in the contract.
- Smart contracts can be tailored specifically for any real estate agreement (tenancy, maintenance, escrow management.) They can be legally binding and enforceable as they

can be converted to a traditional legal format. No crypto-currency is used for processing payments, instead contracts interface directly with banking systems in the currencies applicable to the country where the transaction occurred.

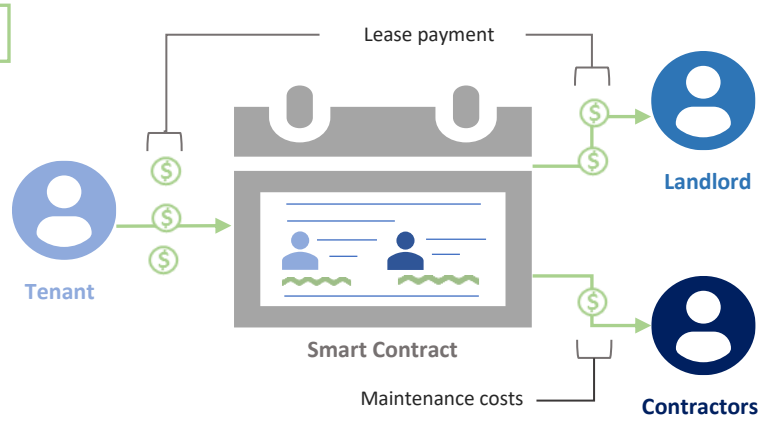
Process:

1



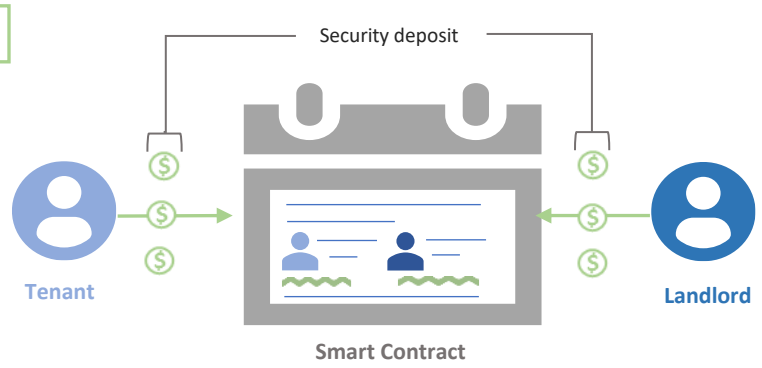
Both parties digitally sign the smart contract (agreement), which includes details such as rental value, payment frequency, and tenant and property details.

2



Based on the terms of the contract, the smart contract periodically initiates the lease payments from the tenant to the landlord and contractors.

3



On termination of the lease, the contract triggers the payment of security deposit back to the tenant after adjusting for any damage repair charges.

Using advanced cryptography, confidential information is securely encrypted from public view. Only contract signatories can grant permission to third parties in order to view the details. However, signatories may be required to grant access to public authorities in order to comply with city, county, state, and country regulations.

Reference-Deloitte Development LLC, 2017, Deloitte Center for Financial Services