Distributed Blockchain Framework against Cyber Attacks: A Real Estate use Case

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Abstract- A huge amount of data, generated by different applications in computer network, is growing up exponentially based on nonstop operational states. Such applications are generating an avalanche of information that is disruptive for predictable data processing and analytics functionality, which is perfectly handled by the cloud before explosion growth of Big Data. Blockchain technology alleviates the reliance on a centralized authority to certify information integrity and ownership, as well as mediate transactions and exchange of digital assets, while enabling secure and pseudo-anonymous transactions along with agreements directly between interacting parties. It possesses key properties, such as immutability, decentralization, and transparency that potentially address pressing issues in real estate transaction, such as incomplete records at point of care and difficult access to information. An efficient and effective real estate transaction system requires interoperability, which allows software apps and technology platforms to communicate securely and seamlessly, exchange data, and use the exchanged data across real estate transaction organizations and app vendors. Unfortunately, real estate transaction today suffers from fragmented data, delayed communications, and disparate workflow tools caused by the lack of interoperability. Blockchain offers the opportunity to enable access to longitudinal, complete, and tamper-aware real estate records that are stored in fragmented systems in a secure and pseudo-anonymous fashion. The proposed system maintains the blockchain base transaction management land records and automatic data recovery from third party attacks, the system also address the issues of data inconsistency during the transaction.

I. INTRODUCTION

The world is changing incredibly fast, and we are not all aware of it. Block chain technologyand crypto currencies are an irreversible advancement that is disrupting established industriesand the ways in which we interact financially. For that reason, I believe understanding andbeing aware of this block chain wave is incredibly important. The existing systems work ascentralized architecture in database system.

- Large data storage at the required of decentralized data storage as well as informationsystem
- The different attack issues in centralized database architectures.
- There are no automatic attack recovery in central data architectures
- The decentralized architecture provides the automatic data recovery from different attacks.

After the analysis of this system we move to develop the decentralized system architecture, andfog computing provide parallel processing in distributed environment.

II. LITERATURE SURVEY

On the governance of OI and BT platforms, ("Blockchain Governance", 2017) [1] writes that at the heart of the problem, as always, lies the governance challenge, namely who dictates and enforces the rules as well as who do system hold accountable when things not working in proper manner. What developers don't understand is that the public wants to put confidence in the institutions that operate the "conventional" platforms, especially when they are exploited by real people, so that they can be held accountable. For example, Airbnb was built on a notion that people are organized, but soon enough trust problems arose like bad consumer experience, fraud, vandalism, etc. Soon Airbnb has evolved from a technology company and a standard platform of rules and authority. As long as the challenges of blockchain governance are not considered, BT's transformer potential will not be realized.

According to Lember, 2017 [2] In fact, the various technologies associated with the "smart city" such as electronic sensors or urban control rooms and urban labs, as well as emerging technologies such as the chain of blocks, 21 that allow the Provision of point-to-point services are increasingly at the centre of how citizens engage in the delivery of public services as part of the user/Citizen IO Program-innovation, Technology and living Labs for Accelerate technological Innovations in the public sector. All of these approaches aim to put the user's experience at the centre of Public sector innovation processes, however, these experimental units and methods are still far from becoming an organic part of the public sector and their change.

According to Pazaitis et al., 2017 [3] It explores the potential of blockchain's technology by allowing a new value system that will better support the dynamics of social exchange. The study of the system begins with a discussion on the evolution of perceptions of value in the history of economic thought. Beginning with a vision of value as a mechanism that defines meaningful action in a given context, the system combines the

pricing system with the establishment of capitalism and the industrial economy. System, then discuss its relevance to the information economy, exposed as the techno-economic context of the shared economy, and identify new ways to create value that better reflect the social relationships of sharing. Through the illustrative case of Backfeed, a new system of values is envisaged, consisting of three layers: (a) value production, (b) Value Registration and (c) updating the value. In this context, the system addresses the solutions presented by Backfeed and demonstrates a conceptual economic model of decentralized cooperation based on blockchain. The system concludes that blockchain technologyhas the potential to enable the creation of common property-based ecosystems in a shared economy.

According to Potts et al., 2017 [4] Smart City's agenda for the integration of ICT and IoT, the IT infrastructure to improve the efficiency and adaptability of the city's government has been the implementation of urban development policy for more than a decade. A smart city has more data, compiled with new and better technologies, offering better quality urban services. BT could change the Smart City agenda by changing transaction costs with implications for infrastructure and resource coordination and by encouraging OI as outlined in the previous section. As the city's smart city crypto uses data computing, and is coordinated by distributed rather than centralized systems. The crypto-urban data infrastructure can enable civil society to execute local public goods and facilitate economic and social entrepreneurship in the IO.

According to Blockchain and Open Innovation", 2017 [5], In recent years, a new technology has been developed – blockchain – which is expected to replace many existing digital platforms. The first came to light at the end of the years 2000 as the architecture for Bitcoin, the most famous virtual currency. But, as with the Internet, the web and other important technologies, blockchain (BT) technology has now transcended its original goal. It has the potential to revolutionize the financial industry and transform many aspects of the digital economy. Open Innovation (OI) and IP industry (IP) will also be affected, so here the system addresses issues regarding BT's adoption in OI to be discussed in this document.

According to Davidson et al. 2016 [6] as said, BT is a new technology of institutional governance that rivals other economic institutions of capitalism, namely businesses, markets, networks and even governments. Present this vision of BT through a case study of Backfeed, a platform based on Ethereum to create new types of collaborative economies based on the Commons. This case was developed to evaluate contributions to projects in a network. Backfeed introduces a social protocol on blockchain-based infrastructures to coordinate people through the creation and distribution of economic tokens and reputation scores. Its goal is to eventually enable the emergence of meritocratic systems and emerging alternative economies that can increase or replace in a variety of ways existing modes of economic governance (i.e., provided by hierarchies or the markets). In essence, Backfeed is an engine of decentralized cooperation between distributed agents. It implements a social operating system for decentralized organizations, enabling a massive Open-source collaboration without any form of centralized coordination.The Backfeed is based on the power of Open source collaboration and enriches it with a distributed governance system for the production and distribution of decentralized values. A peer-to-peer evaluation system is used to determine the perceived value of each contribution in a decentralized manner, in order to assign influence and rewards accordingly.

According to Johansen, 2016 [7], Because of the novelty of the underlying concepts and technologies, the system provides a new overview of recent developments and literature related to this book and strives to explore related concepts in the literature. Through the exploration of concepts, the immersion system in the use of blockchain as a technological platform for a future ecosystem of applications and software and to look at the theoretical characteristics of technology as a basis of this role. As a result, the system improves the understanding of technology in other contexts throughout the literature and explores current contributions to literature. This study has implications for investigators and practitioners. For researchers, the system seeks to open up research lines on BT's empowerment as a platform-centric technology for ecosystems to thrive as OI. For practitioners, the system shows that it is crucial to continue to develop the technology, as research indicates that the system has not yet reached the tipping point of technology.

According to Glaser &Bezzenberger, 2015 [8] After the theoretical introduction, this system aims to deepen the theoretical grounding in order to give a brief summary of the preliminary research and to highlight the potential areas for future research. In addition, the system seeks to establish a common understanding of the theory in the field of OI with respect to BT. In the field of OI research, BT is still considered an innovative innovation and has not yet been part of the Mainstream OI research. This is further supported by the general landscape, whose main focus has been on blockchain as a cryptographic economic system, e.g. Bitcoin. The system also considers the amount of literature in the region as an important factor in evaluating the maturity of the concepts. System to find that the Bitcoin concept with 24 500 results was explored similar to blockchain with 17 500 results in Google 3 academic. which increased by 10 in just a year of 2016 compared to the first search engines of (Johansen, 2016). There is still a gap to understand the BT in OI. This system tries to give a new perspective on BT by examining current BT research and combining this with other OI concepts such

as blockchain as a platform, ecosystems, innovations and characteristics Technological.

III. PROBLEM STATEMENT

In the propsoed research work to design and implement a system for real estate transactional data, where user can store all information in single blockchain without any Trusted Third Party (TTP) in distributed computing environment. The system also carried out data integrity, confidentiality as well as eliminate the incinsistency for end user.

Proposed System

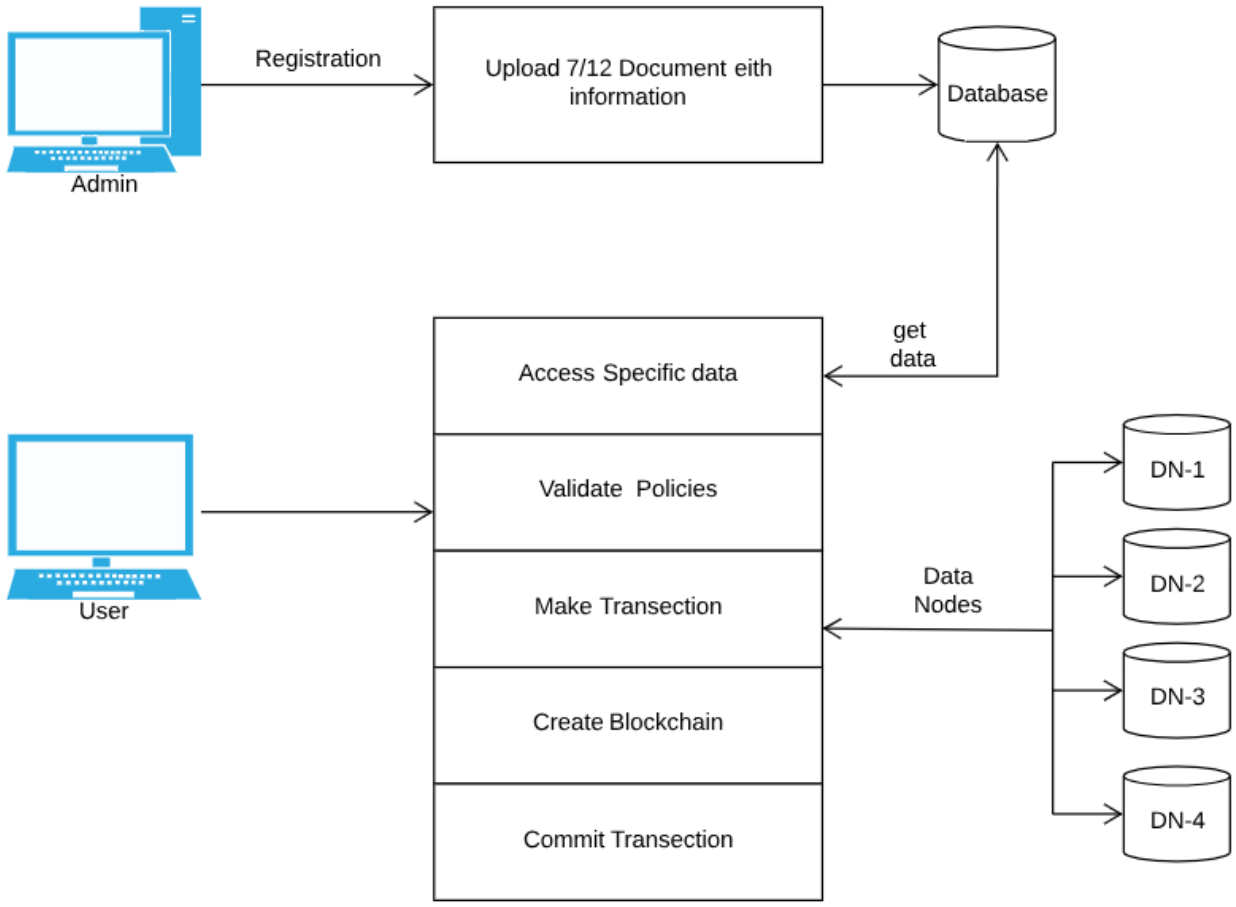

Fig.1: Proposed System Architecture

Implementation Procedure

1. We create a multiple land transactional data and stored all transactional data into multiple data nodes.
2. Each node will holds the specific block for each transaction.
3. Same block has replace for all nodes, and generates a valid block chain.
4. System will retrieve data from all data nodes and commit the transaction, it should be any kind of DDL, DML as well as DCL transactional query.
5. If any block chain invalid during the validation of data servers, then system will automatically
Recover whole blockchain using majority of servers.
6. We will address and eliminate the runtime server attacks and recover it using own blockchain.
7. System will provide the each transactional validation, for all servers.

Algorithms

Hash Generation
Input : Genesis block, Previous hash, data d,
Output : Generated hash H according to given data
Step 1 : Input data as d
Step 2 : Apply SHA 256 from SHA family
Step 3 : CurrentHash= SHA256(d)
Step 4 : Retrun CurrentHash

Pseudocode: Protocol for Peer Verification

Input: User Transaction query, Current Node Chain CNode[chain], Other Remaining Nodesblockchain NodesChain[Nodeid] [chain],

Output: Recover if any chain is invalid else execute current query

Step 1: User generate the any transaction DDL, DMLor DCL query

Step 2: Get current server blockchain Cchain←Cnode[Chain]

Step 3: For each

$$NodesC\square ain\,[Nodeid, C\square ain]\sum_{i=1}^{n}(GetC\square ain)$$

End for

Step 4: Foreach (read I into NodeChain)

If (!.equals NodeChain[i] with (Cchain))

Flag 1

Else Continue Commit query

Step 5: if (Flag == 1)

Count = SimilarNodesBlockchian()

Step 6:Calculate the majority of server

Recover invalid blockchain from specific node

Step 7: End if

End for

End for

Mining Algorithm for valid hash creation

Input : Hash Validation Policy P[], Current Hash Values hash Val

Output : Valid hash

Step 1 : System generate the hash Val for ith transaction using Algorithm 1

Step 2 : if (hash Val.valid with P[])

Valid hash

Flag =1

Else

Flag=0

Mine again randomly

Step 3 : Return valid hash when flag=1

IV. RESULTS AND DISCUSSION

For the system performance evaluation, calculate the matrices for accuracy. The system is executed on java 3-tier architecture framework with INTEL 2.8 GHz i3 processor and 4 GB RAM with distributed environment. The below figure 2 shows the time required for consensus algorithm to validate the blockchain in 4 nodes. X axis shows the size of blockchain and Y shows the time required in milliseconds with respective 4 nodes.

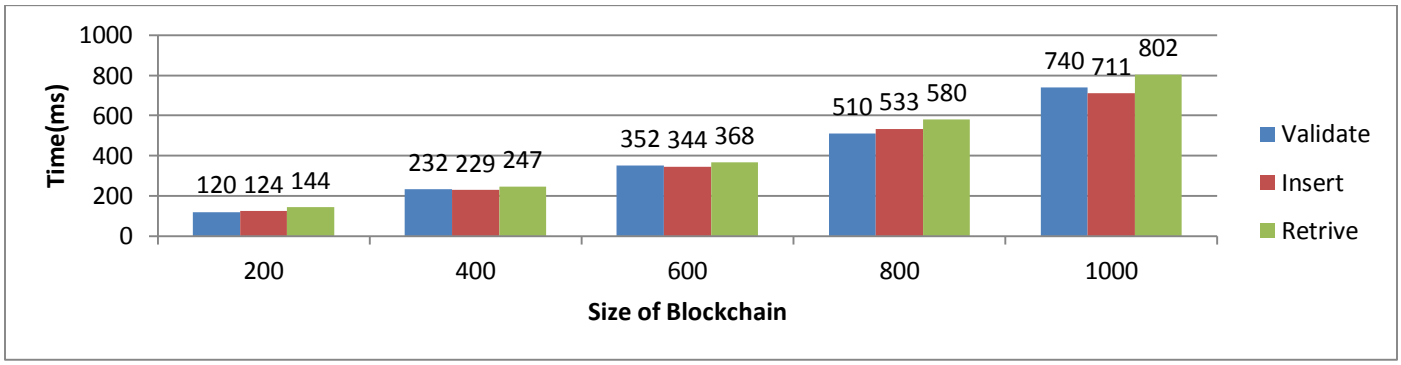

Fig.2: Time required (in milliseconds) for complete transaction with different records blockchain using 4 data nodes in P2P Network

V. CONCLUSION

There are many research directions in applying Blockchain technology to the real estate transactiondue to the complexity of this domain and the need for more robust and effective informationtechnology systems. An interoperable architecture would undoubtedly play a significantrole throughout many real estate transaction use cases that face similar data sharing and communicationchallenges. From the more technical aspect, much research is needed to pinpoint themost practical design process in creating an interoperable ecosystem using the Blockchain technologywhile balancing critical security and confidentiality concerns in real estate transaction.Whether to create a decentralized application leveraging an existing Blockchain, additional researchon secure and efficient

software practice for applying the Blockchain technology in realestate transaction is also needed to educate software engineers and domain experts on the potentialand also limitations of this new technology. Likewise, validation and testing approaches togauge the efficacy of Blockchain-based health care architectures compared to existing systemsare also important (e.g., via performance metrics related to time and cost of computations orassessment metrics related to its feasibility). In some cases, a new Blockchain network maybe more suitable than the existing Blockchains; therefore, another direction may be investigatingextensions of an existing Blockchain or creating a real estate transaction Blockchain thatexclusively provides real estate transaction services. Blockchain technology should preventthe insecurity and injustice that are part of these land registries. The shared ledger technologyshould bring trust.

VI. REFERENCES

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