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Identity Chain- Identity Verification Framework Using Ethereum

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ABSTRACT: In any of the registration processes, it is a hassle to always carry a physical document. Not only that, the process is extended if they are lost, and if unauthorized persons have access to those documents then it will contribute to identity theft, and apart from that India has a huge population. Thus the process of authenticating the identity of every citizen should be reliable, fast, and secure. The current systems in place are functional, but they prove security breaches and data tampering. The current process usually takes several weeks for authenticating a citizen's identity with the government bodies. It is inconvenient, time-consuming, and environmentally expensive. Our proposed system will overcome these shortcomings of existing systems with the help of Blockchain Technology. Our objective is to design a blockchain-enabled Identity Verification System Framework that helps solve identity verification issues and increase ease of access to documents. We generate a decentralized system, using the concept of blockchain, to allow registered persons to access user's documents. In conclusion, This project enhances the area of Identity verification that is vital in helping society to control their details and digitizes the personal identities of the people using blockchain. An identity verification system that increases the trust that data is secured and it's hard to hack or change data.

KEYWORDS: Blockchain, Ethereum, Security.

I. INTRODUCTION

Blockchain is a chain of interconnected blocks that contains information, This technique originally described in 1991 by a group of researchers was originally intended to timestamps the digital documents so it's not possible to back-stamp them or to tamper them like notary but went unused until it was adapted by Satoshi Nakamoto in 2008 to create a digital cryptocurrency bitcoin, Blockchain is distributed ledger that is completely open to anyone have interesting properties one data is inserted into the blockchain it becomes very difficult to change it. It was the founding technology initially used in Bitcoin, a digital currency. Blockchain has since seeped its way into various domains. Blockchain is a decentralized peer-based network, where each peer, also called a node, stores information about all the transactional records of the network. Every transaction is linked to the previous node on the chain, and before being stored needs consensus or also called quorum from more than half the nodes on the chain. Hence, the trust, immutability, and security are high as changing any block of the chain would need previous blocks to be changed too, which is not very feasible to attackers.

India has a large population of nearly 134 crores. With a population that high, the process of issuing and verifying the identity-based documents such as (Passport, Adhaar Card, PAN Card, Voters ID, etc.) of every citizen must be reliable, secure, and quick. The current systems in place are functional, but the efficiency and security need to be improved drastically as the process usually takes several weeks and the citizens applying for the documents may have to visit the issuing authority offices multiple times to get documents done. This is not only inconvenient and time-consuming but also monetarily and environmentally expensive.

In this report, we have discussed a blockchain-based solution for verifying the authenticity of the documents issued by the Indian Government authorities. The advantage of using this system is that it provides a quick, reliable, and secure channel for issuing authorities to access documents of an individual who has other documents directly from the

databases of The other issuing authorities. This access is permission and time-bounded so privacy concerns are eliminated.

II. MOTIVATION

Issuing the documents for citizens using traditional methods is very time consuming and expensive, the person who is creating the documents may have to visit the issuing authority multiple times for the same documents, And multiple documents need to be issued once in a lifetime such as (Adhaar, Passport, PAN, Voting, etc.) This creation of documents consumes the government resources and creates immense pressure on government infrastructure.

To reduce this pressure on government bodies, fasten the service speed, And create a very safe decentralized database where every transaction is transparent, blockchain technology is most suitable. It was initially used in cryptocurrencies but now most big organizations and nations have started to use this technology, hence, we are using the blockchain to improve and overcome the shortcomings of the current process of the identity verification system. We are presenting the structure of blockchain to create a new identity verification system framework that can verify the user in a few minutes.

III. PROBLEM DEFINITION AND OBJECTIVE

Our objective is to design a blockchain-enabled Identity Verification System Framework which is user-friendly, fast, secure, and helps to solve identity verification issues and increase ease of access to documents.

IV. PROJECT SCOPE

In this century, the strategies used in creating verified documents are very slow and time-consuming, thus, building a straightforward web application isn't ideal for this reason because the data can be hacked, the data rules can be changed and the trust of the citizens is lost. Hence we are changing the verifying process. A blockchain-based System Framework that isn't just secure from defilement, yet additionally gives solid protection from hacking and various cybercrimes. Using this technology we can work well under budget and in a limited time, we can achieve more. The most significant factor of this application is that not even the software engineers can modify the data once put together by an authorized body. It easy to sign into, doable, and simple to utilize the straightforward application

V. USER CLASS AND CHARACTERISTICS

- Authorized User/ Manager: A manager is an end-user who can enter the credentials of documents to check if that person is authorized or not and also he/she can view the documents of any person.
- Nodal Authorizer: Nodal Authorizer is an admin who is a higher authority or a police officer, who can not only add or update the documents of any citizen but also verify that the person is authorized or not and if any person is not authorized then flag that document and inform the manager and police.

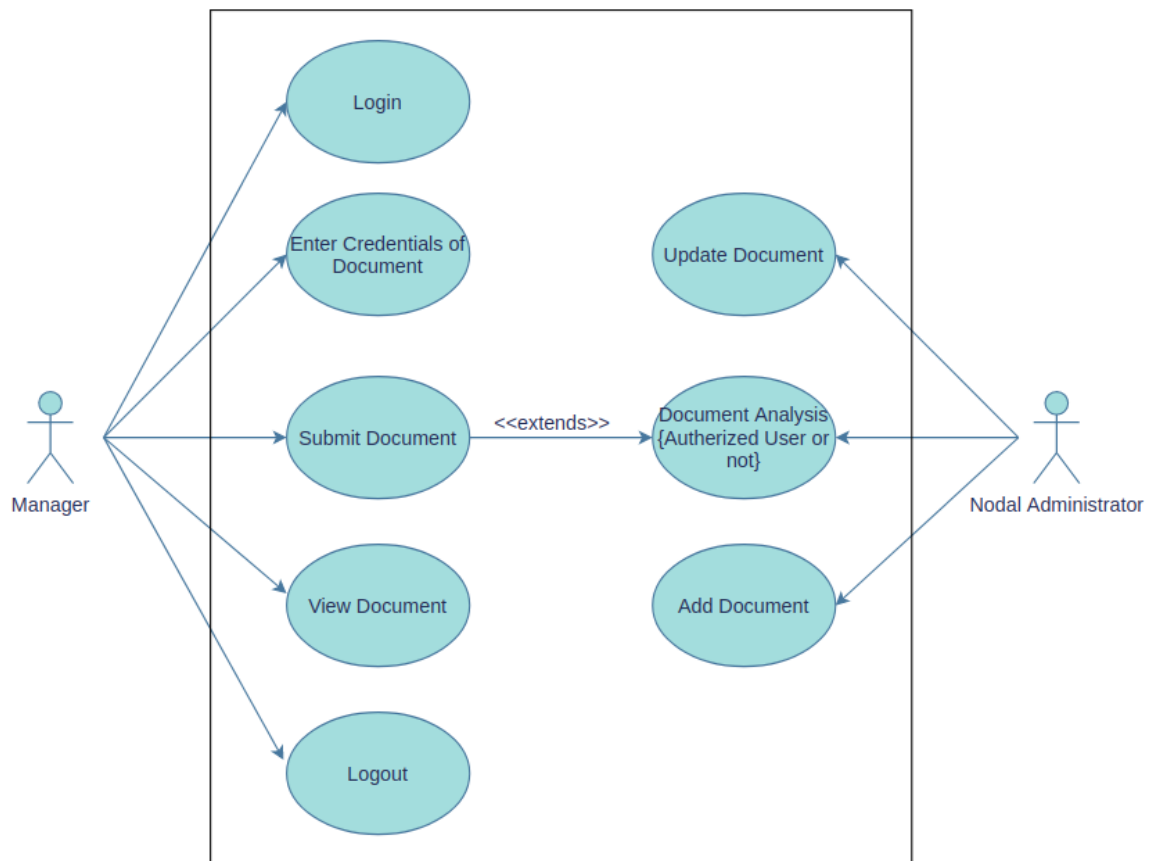


Fig 1: Use Case Diagram

VI. FUNCTIONAL REQUIREMENTS

- Authentication: This system will authenticate every citizen and verify that the person whom they say they are, is in the real world or not.
- Decentralized database: In that System, we are using a blockchain which is the most secure decentralized database, and also solve the disadvantages of a centralized system.
- Fast: The current system has taken 10 to 15 days to verify the user's identity, our proposed system will take only a few minutes to verify the user.
- Authorized User where it can be used to verify one's identity.
- The authorized body will add the data into the nodes.

VII. SYSTEM ARCHITECTURE

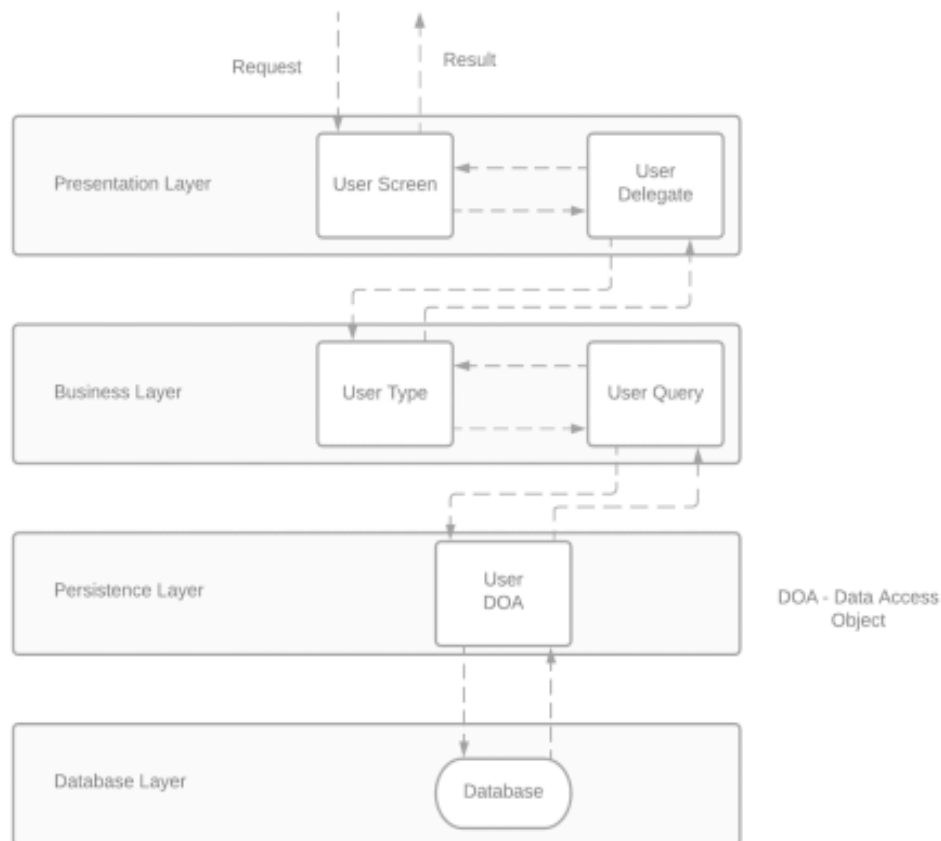


Fig 2: System Architecture

The above Diagram will show an abstract view of the IdentityChain. The system has two actors (Manager and Nodal Authorizer). If the user is a Manager then he/she can enter the credentials of the document and check that the document is real or fake. The system checks the credentials in the blockchain system and shows the output. If the user is a Nodal authorizer then he can manage different parts of the system such as Modify documents, Add Documents, Flag Documents if that person has any criminal records.

VIII. ADVANTAGES

- As the default record keeper for society, Government entities are large targets for hackers. But rather than accepting such attacks as the cost of doing business in the information era, they could be avoided through the responsible deployment of blockchain data structures.
- Because of the blockchain, the system is Decentralized, Transparent, and Immutable.
 - This Framework is Efficient, Tamper-proof, and Reliable

IX. LIMITATIONS

- If wrong data is stored in the UIDAI database then the system might not be able to correctly authenticate the user. As this framework would receive user credentials from such databases.



X. APPLICATION

- The Identity Chain has numerous applications. We can use this framework in all types of elections as it provides a means to authenticate a user's identity. It would be the most feasible & effective option in situations such as electing
 - Organizational leaders,
 - Departmental Heads, etc.
- This framework can be used in any government activity where the user/candidate needs to Verify.
- This Framework can be used in the recruitment process of various organizations.
- Also, this framework can be used to verify guests checking in to a hotel.

XI. CONCLUSION

The idea of adapting the Ethereum Based Identity Verification System framework is to make the Identity Verification System secure and user friendly because the traditional system has limitations of identity theft, data loss, and also these systems take 10 to 15 days to authenticate the documents. To avoid those shortcomings we have developed the Ethereum Based Identity Verification System which can solve those shortcomings using blockchain technology.

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