

Whistle blower protection using block chain

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Abstract – This paper explains the concept of whistle blower protection by using the principle of blockchain. It attempts to highlight the role of the whistle blower application in shaping the future of the society.

Key Words: blockchain, hyper ledger, proof of access, smart contracts, whistle-blower.

1. INTRODUCTION

Whistleblowers are the people/persons who exposes or reports the activities and people involved in the violation of acts, laws, corrupt practices etc. The activities of wrongdoing can be anything which violates the laws, fraud, corruption, threat to public interests, etc. We need such people with social responsibility in our society in order to maintain harmony and raise voice against the misuse of power by officials. This helps to maintain democracy in the country. It's the duty of the government to protect whistleblowers so that that they can lead a life without the fear of threat from officials. Now a days many whistleblowers in our country are getting murdered. According to statistics in past few years, more than 20 whistleblowers were murdered and nearly 70 people who filed a case of the uncertainty in various departments were killed. Because of these incidents, there is a rise in fear in the people to complain against the unlawful things in government. Because of this, gradually democracy will become dictatorship of people who have power.

In order to reduce scams, corruption and to uplift the democracy in the country we need stringent laws to be enacted. A whistle blower in our country needs to give his details for successful filing of complaint. In many cases these given details come out and this leads to death of that whistleblower.

So in this paper we propose a way by which we can indirectly protect the whistleblower. He can file a complaint without the fear of getting identified by anyone. He can maintain anonymity while filing case.

Blockchain is a virtual, distributed database that maintains a shared list of records without the need of an intermediary. Here the database is made up of blocks. In a blockchain the records are connected to each other using a hash function mostly sha265. This is one of the most secure hashing algorithms. The structure of the block consists of the data of the block, hash of that block and hash of the previous block. Hence blockchain is a continuous growing list of records which are resistant to any modifications.

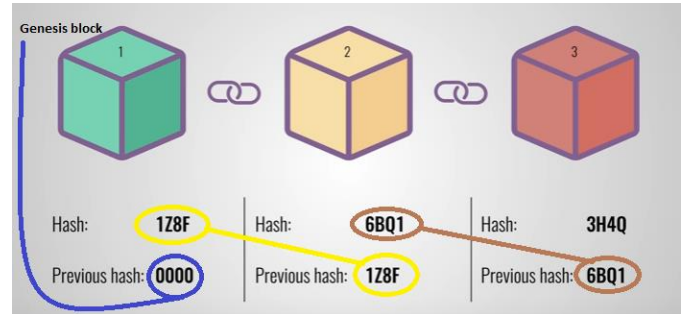


Fig -1: Working of Blockchain

In this application, we record the complaints filed by the whistleblowers and use the blockchain technology to store the data and maintain anonymity of the users.

2. PROPOSED MODEL

The following are the components of the proposed model:

1. Website with aadhar API integration for verifying the user
2. Sawtooth hyper ledger for maintaining the anonymity
3. Smart contracts for differentiating the spam and case.
4. Hierarchy model for blockchain to view the complaints.

Website with aadhar API integration for verifying the user:

Aadhar data is available as an API service. In our application we can use the Sub-AUA(Aadhar User Agency) approach to leverage the Aadhar data for authentication purpose. Sub-AUA Approach: There are few third party Aadhaar authentication services which offer their platform as a service. These organizations go through the process of registration with the UID (Unique Identification) and help us get a Sub-AUA license. Now a days platforms like Aadhar Bridge, Aadhar API, ekyc online has a developer friendly platform where one can leverage UID for Authentication and eKYC.

The website will be a user-friendly interface where we use a third party aadhar API for authentication of the user. The aadhar api sends an OTP to registered mobile when the user enters his name and aadhar number or VID. The user needs to go through this process every time he wishes to view the complaints or file a complaint. After authentication user enters in to next page where he can see two buttons “ file a complaint” & “view exiting complaints”. When user clicks the view the complaints button, he will be asked to select from the two options valid complaints and invalid complaints

(spam). When he selects either of the options he will be allowed to see all the complaints in that particular option in the public ledger with proofs which are linked with hash function of a userid. Against each valid complaint, the user can see two buttons resolved and open. Against each invalid complaint user can see an upvote button. When user clicks on file a complaint button he moves to another page where he needs to select state, district, department and under which government department the complain comes under i.e either central or state. Then he proceeds to next page where he needs to select the authority and he needs to write a complaint. The user is provided with an option to attach the proofs like videos, documents, etc which are linked to his complain.

Sawtooth hyper ledger for maintaining the anonymity:

Here we selected the use of Sawtooth hyper ledger for two things,

a) **Permissioned blockchain mechanism:** In this permissioned blockchain mechanism the authentication of transaction is given to an authority in an area to authenticate the transaction i.e the complaint filed by a person. He has to even authenticate the complaint as resolved and close it once the resolution is obtained. In order to avoid the human errors in it, we propose an algorithm i.e. **proof of access** which works instead of proof of work.

In order to avoid human interference or human error we propose an algorithm instead of proof of work in blockchain in smart contract.

Proof of access (POA): This algorithm makes sure that the person who authenticates the transaction needs to categorize the transaction as a valid or invalid within 48 hours or any time period. Either a new complaint will be moved into of the blockchain i.e valid complaints or invalid complaints (spam). Depending on the authentication given by him as valid or invalid respectively. If he does not give the authentication within 48 hours or any time period then the new complaint will be automatically considered as valid and goes into valid complaint blockchain. By using proof of access we can reduce the manipulations by humans. There are different cases involved in authenticating a transaction or complaint as valid or spam. The various possible cases are explained as follows.

Case (1): We have the appointed person who needs to authenticate the complaint. There may be a case where he wantedly ignores to authenticate the complain. In this case we fix a time period in the proof of access algorithm, such that the action needs to be taken on the complaint within that time span. Otherwise the complaint is marked as valid after completion of time period.

Case (2): There may be a case where the person may categorize the transaction as an invalid transaction for the benefit of the party on whom the complaint is raised. In order to avoid this every block in spam folder is added with upvote button. By this if specified number of people upvote

for it to be valid complain, the content in the blockchain will be copied to the valid complaint chain nothing but duplicating it. The specific time intervals and different IP's are considered in order to avoid the malpractice using bots. By this only one vote from an IP address is accepted at a time interval.

Case (3): Similar to upvote button there will be a resolved button in the valid transaction blockchain. By using this button, the complaint can be closed after a resolution is obtained. There may be a case where the complain has been intentionally closed as resolved by the official appointed to authenticate the complaints. In such case the users can upvote for a closed complaint and reopen it. Thus it will be moved to the valid block chain of open complaints.

b) **Parallel transactions:** This feature of sawtooth hyper ledger enables us to do transactions independent of others which means at a time multiple users can perform transactions. So it enables multiple users to perform transactions at a time. We create different blockchains based on area and department. By this we maintain different types of blockchains and any one can view the transactions by authenticating himself with Aadhar API and by selecting the department and area.

Smart contracts:

Smart contracts is a computer protocol, which is intend to perform certain operations. In order to reduce the third parties in the applications, we use smart contracts to perform various protocols.

- i. To authenticate the user and allow him by the use of aadhar api
- ii. To authenticate transactions if it takes more than 48 hours
- iii. To perform parallel transactions
- iv. To copy the same data in spam to complaints blockchain if condition is valid
- v. To copy or print any of the transactions in the public ledger.
- vi. Not to add some restricted department complaints in public ledger and add it to private blockchain which can only be seen by CBI, ACB
- vii. To open the closed complaint by the people who feel it is not closed and still need to be addressed

Hierarchical model for blockchain to view the complaints:

The higher officials of a region will be able to view the complains of that region. In order to view the complaint and the status of the complaint filed at different regions, we interconnect each block chain of each department using a specified hierarchy model. In this model, the blockchain of

state is connected to genesis block of district blockchain in which each block of district is connected to genesis block of region blockchain and so on. In region blockchain complaints are added as blocks. This complaints are authenticated by regional person who are incharge of it. These complaints are viewed by higher officials upto state level. By this hierarchy model the higher officials constantly see the status of complaints.

- 2) https://beta.vu.nl/nl/Images/werkstuk_bruyn_tcm235-862258.pdf
- 3) <https://aadhaarapi.com/authentication/>

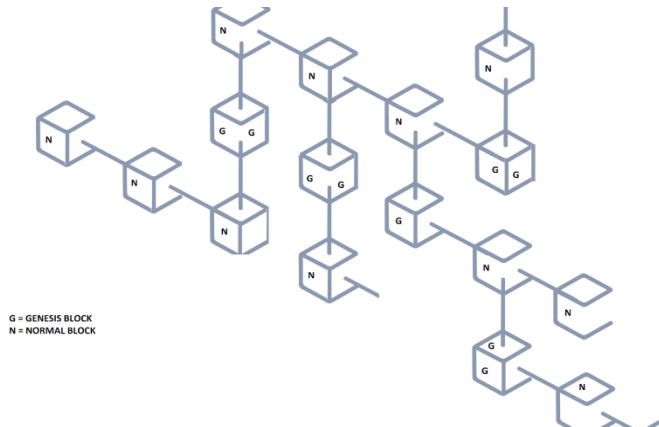


Fig -2: Proposed hierarchical Model of Blockchain

3. POSSIBLE IMPLICATIONS

1. With this application the performance of governance can be measured
2. The people participation in making decisions increases
3. Fear of being known will be reduced in the society
4. Government would be more focused on people centric developments.
5. It will reduce the corruption, red tapism and scams in the government
6. Wastage of public money will be reduced
7. Democracy will be prevailed.

4. CONCLUSION

Government should alter laws in order to accept the digital complaints filed by this website. Government organizations like CBI, ACB can maintain an officer to regularly watch the complaints in this website and also perform background enquiry. The proofs submitted by any users need to be checked for validity and then armed officers can easily take actions on it. Cases should be divided based on the jurisdiction or area. As the users can view the compliants filed, there is an increase in transparency.

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