

Virtual Police Station

Tirlochan Singh
1701209389
7th, CSE,
B

Ashutosh Rath
1701209093
7th, CSE,
B

Guru Sauri Vargav
1701209337
7th, CSE,
B

Chiranjibi Rout
1701209375
7th, CSE,
B

Supervised by: Dr Kasturi Dhal

Abstract—In India, we can see that technology has touched in every aspect of our life. There exist technology in all the fields e.g. education, agricultural, business, government etc. and we can also understand how beneficial it is, as it saves the time, money and human power. In spite of being technologically advanced, the system lacks in security perspective. When we talk about today, India has moved to the era of digitalization after the launch of the campaign “Digital India”, the Indian Police Department has replaced the manual system with the centralized online process to register the complaint. The main objective of this paper is to provide a method to secure the FIR system using blockchain technology. This introduces to the essential principal of blockchain technology and its future in the police department of India. Blockchain technology will also explain to protect the FIR from the malfeasance.

Keywords— *IPFS, Decentralised System, Blockchain, Web Application*

I. INTRODUCTION

Imagine a ledger in a distributed network, which contains all the transactions, plus updates itself whenever there is a fresh transaction. The ledger is not in the aids of a centralized administration, and each individual in the distributed network carries a portrait of the ledger. However there is a challenge; once an article is recorded on the ledger, it cannot be destroyed. That signified the concise summary about blockchain technology. In the primary journal about the blockchain technology, the first application which was addressed was Bitcoin. At present this technology is maintained to preserve the bitcoin transactions, this digital record doesn't fall below one administration. Individual

transactions are recorded on the bitcoin network, in this, every individual system is a node. These nodes act autonomously during executing the mathematical functions, computing the transactions. The aforementioned transaction will be communicated to other nodes in the decentralized fabric network by a multi-hop broadcast. The critical component is combining a transaction.

II. BACKGROUND

- **Blockchain Technology**:- A blockchain is, in the simplest of terms, a time-stamped series of immutable records of data that is managed by a cluster of computers not owned by any single entity. Each of these blocks of data (i.e. block) is secured and bound to each other using cryptographic principles (i.e. chain). Hence, anything that is built on the blockchain is by its very nature transparent and everyone involved is accountable for their actions.
- **IPFS**:- At its core it is a versioned file system which can store files and track versions over time, very much like Git. It also defines how files move across a network, making it a distributed file system, much like BitTorrent. In combining these two properties, IPFS enables a new permanent web and augments the way we use existing internet protocols like HTTP.
- **Ethereum**:- Ethereum is a decentralized open source blockchain featuring smart contract functionality. Ether

is the native cryptocurrency token of Ethereum platform. It is the second-largest cryptocurrency by market capitalization, behind Bitcoin. Ethereum is the most actively used blockchain in the world. Ethereum was proposed in late 2013 by Vitalik Buterin, a cryptocurrency researcher and programmer. Development was funded by a crowdsale that took place between July and August 2014 and the system went live on 30 July 2015, with 72 million coins premined.

- **Smart Contract:-** A smart contract is a computer program or a transaction protocol which is intended to automatically execute, control or document legally relevant events and actions according to the terms of a contract or an agreement. The objectives of smart contracts are the reduction of need in trusted intermediators, arbitrations and enforcement costs, fraud losses, as well as the reduction of malicious and accidental exceptions.

III. SECURITY IN BLOCKCHAIN

The main characteristics of the blockchain technology is the level of security it provides to the network. This technology uses the cryptographically engineered block to make the information secured, the use of SHA-256 and hash tree are the few algorithms used in this. When we are performing these algorithms, we are basically hiding the identity of an individual – this will help to create a no trust network. When a case is filed, the suspect will not know the individual's identity then there will not be any manual intervention in the case – the proceeding of the case will carry out smoothly. The decentralization of blockchain is an add-on benefit as there would not be a central govern person to interfere. When there is a single administration there is a single point of failure, the deletion of the data is easy in the network. The system that we are going to address will avoid all these security threats, we will be developing this system from the open source marketplace, which will rely on the Blockchain technology

IV. LITERATURE OVERVIEW

The concept of Blockchain technology was first proposed by Satoshi Nakamoto, it is a cryptographically engineered software platform to store ledger using peer to peer network. It is a sequential chain of blocks where every block contains a cryptographically hash value of previous block, time-stamp and the block information. From the above method we can ensure the integrity and security of the block and we can identify the invalid block. The first application of this technology was Bitcoin, which allows cash transaction using internet, through peer to peer network without a central authority and in a trustless network. The author gave a resolution to the problem of double spending. The system uses the method of timestamp by hashing the block into continuous chain based on proof of work mechanism.

We have blocks in the Ethereum blockchain, these blocks are linked together and each blocks we have list of transaction similar to bitcoin. Inside these transaction we do have timestamp and other parameters which we can programme it. Ethereum blockchain gets stored in every miners computer which is called a node, it uses the proof of work algorithm to verify the network. The block contains the smart contract which has the code snippet that runs in each block, when the code computation is successfully executed in each miner's computer. It is sent to whole network so that the other miners can agree. The successful verification of the block will be added to the chain.

V. PROPOSED METHOD

The workflow to launch an FIR is as follows:

- The Complainer will have to login to the User Interface using there Aadhar number which will act as a protector so that we can verify them (The platform requires no need of any registration process for the user). Once the user is in the home page, he/she will have different option to launch an FIR
 1. Manually writing the FIR
 2. Interacting with the chat bot to launch the FIR

3. The user will have a option to provide evidence in image, audio or video format.

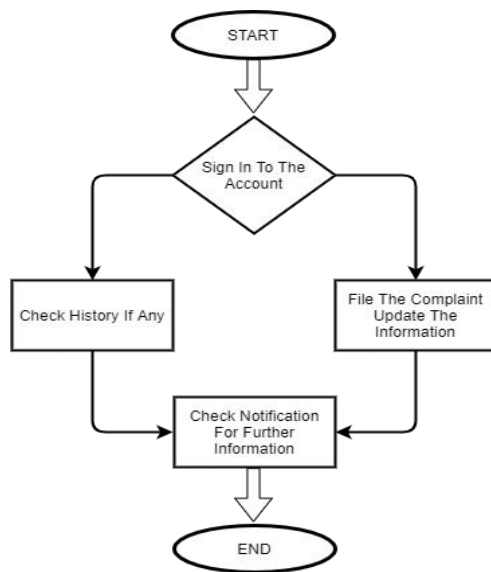


Figure 1.1 Flow Diagram (User)

- Once the FIR is launched successfully to the desired police station, the head of the police station will have the option either to investigate by his/her own or to assign a investigating officer to investigate. Investigating officer will investigate into the matter with the CID value of the FIR, investigating officer will also provide regular update to the user with the CID value he/she is working with.
- Any changes in the FIR done by the investigating officer will act as a new transaction, and will be uploaded again in the IPFS as well as in Ethereum network so that the user will get regular updates and can trace the investigation process.
- Once the case is resolved, reward mechanism will assign some sort of reward (which will help the department for the promotion of personals) to the investigating officer (The reward will be based on the type of case solved and the time taken to solve the case).
- The complete system is based on auto escalation facility in which, all the FIR's launched or assigned to the investigating officer will carry some priority which

will be assigned on the basis of certain criteria such as cognizable case will be given more priority, non cognizable case will be given less priority. Based on the priority, if a case with higher priority is not getting updated or is not resolved within a certain duration of time then the case will be escalated to the higher authorities.

- The system resembles multi-level feedback queue upto some extent, where not only cognizable case but also non-cognizable case pending from a long time, will get more priority with time so that they can be resolved.
- If a investigating officer is not able to solve a case then he/she can forward the case to higher authority in that case the investigating officer need to change the public key associated with the FIR with the public key of the higher authority to whom the case handovered, once higher authority accept the case he/she investigate into the matter. (Change of public key with the FIR is done so that user will get a clear idea about who is investigating into the matter)

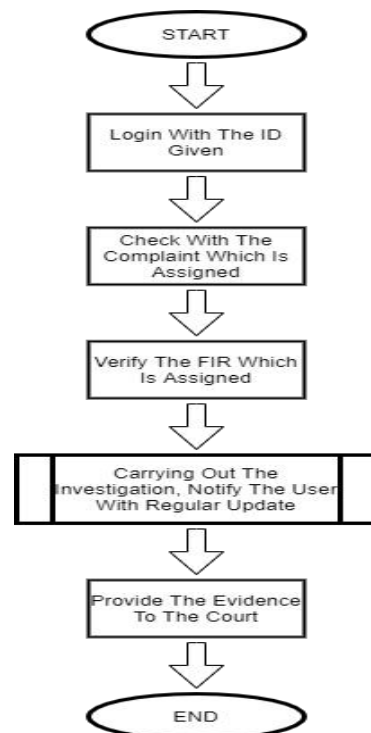


Figure 1.2 Flow Diagram (Police)

VI. CONCLUSION

Blockchain has shown its potential for transforming traditional industries with its key characteristics — decentralisation, persistence, anonymity and auditability. Blockchain based enterprise applications increase the effectiveness of an enterprise, reduce cost of transactions and speed up interactions between the enterprises and its customers. Blockchain provides better security during transactions of any value. It is a unique and a universal technology that helps to streamline and automate nearly all customer services or legal contracts, while increasing the transparency and effectiveness of enterprises. However, a lot of exploration is needed today in domains applying blockchain technology across various business units — on how to minimise enterprise costs, improve security in an era of cyber uncertainty and enhance customer delivery. We are proposing this system to secure the FIR system. We are

trying to make the system simple and efficient. The decentralized network which we are building does not rely on any trust. The registered user can file a complaint through any device which is connect with an internet. The blockchain will make the network more secure, immutable and decentralized, we can say that it will be a corruption free network.

VII. REFERENCE

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