JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

DIGITAL CRIME RECORD MANAGEMENT SYSTEM USING BLOCKCHAIN

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Abstract :
We can clearly observe how technology has impacted every facet of life in India. Technology is present in every industry, including agriculture, business, government, and education. We can see its advantages since it conserves resources like time, money, and labour. Even if the system is technologically advanced, it lacks security. After the start of the "Digital India" campaign, India has transitioned to an era of digitalization, and the Indian Police Department has replaced the manual system for filing complaints with a centralised online one. This paper's main goal is to present a strategy for using blockchain technology to protect the FIR system. This explains the fundamental idea behind blockchain technology and how it will be used by the Indian police force in the future. The FIR will be protected from fraud using blockchain technology, too. We use several signatures to guarantee the reuse of data. We filter out the two nodes with the highest node rank value from the active node's incoming nodes to perform a 2/3 multi-signature, which saves resources, because node's incoming nodes have to make decisions about whether data may be communicated. We use RSA to encrypt and sign the transferred data, enabling data verification for recipients. The blockchain allows for secure data transmission. Validation success suggests transmission success.

IndexTerms **- Crime Record, Blockchain , Multisignature, Smart Contract**

I. INTRODUCTION

Consider a distributed network fabric ledger that not only contains all the transactions but also automatically updates itself each time a new transaction occurs. Each member of the distributed network fabric carries a portrait of the ledger, which is not in the hands of a centralised administration. Nevertheless, there is a problem; once an item is registered in the ledger, it cannot be removed. That denoted a succinct description of blockchain technology. The first application mentioned in the main journal on blockchain technology was Bitcoin. The digital record of bitcoin transactions is currently kept using this technology, and it is maintained by more than one administration. The bitcoin network, in which every individual system is a node, keeps track of individual transactions These nodes operate independently as they carry out the mathematical operations and compute the transactions. A multi-hop broadcast will be used to transmit the aforementioned transaction to other nodes in the decentralised fabric network. Combining a transaction is a crucial element. A valid transaction creates a block, which is then joined to other valid blocks to form a blockchain network.Once the blocks have a sufficient level of consensus, they are validated and added to the chain. Fundamentally, we must demonstrate the veracity of a block before we can link it to the blockchain. When a block is introduced to the network, a certain minimum number of consensus are required. Proof of Work, Proof of Stack, and Byzantine Fault Tolerance are three common consensus mechanisms used to approve the block.. The newly created block impersonates itself with the additional nodes in the distributed fabric network when it is chained with the other block. Every time someone requests to remove a verified block from the blockchain, the entire network must be reconfigured, which is computationally impossible. Imagine for a moment the transparency that would result from the development of a blockchain to support police statements, including First Investigation Reports (FIR). An individual zone in this system is a distributed fabric network node that has a copy of the blockchain. Every time a new complaint is submitted, the system creates a FIR that is timestamped and associated with the complaint. To authenticate the block's integrity, the respected complaint might be given a cryptographically generated hash key. We shall use the consensus technique to demonstrate the authenticity of the block. Each node in the distributed fabric network will receive notification of the valid block along with a timestamp.

II. PROBLEM DEFINITION AND SCOPE

2.1 Problem Definition

Block chain combined with clustering, multi-signature, distinct nodes, and digital crime record management. With SHA 256, we sign and encrypt the data that is transferred, assisting the recipient in data verification. Using the blockchain, data is securely transmitted. that successfully protects the security and privacy of Internet of Things nodes and data by making it more difficult for attackers to attack

2.2 Scope and Objectives

2.2.1 *Scope*

This project is a network limitation. because the number of our blocks and nodes is limited and under the supervision of the central office. Data can be sent between central office and all nodes, and from nodes to all police stations.

2.2.2 Objectives

- To reduce manual work.
- The objective of this system is to provide security of crime data.
- Provide secure centralize distributed network of crime record.
- To prevent data tempering from police department.
- To transfer data between different node over the network

III. SYSTEM ARCHITECTURE

3.1 Proposed System

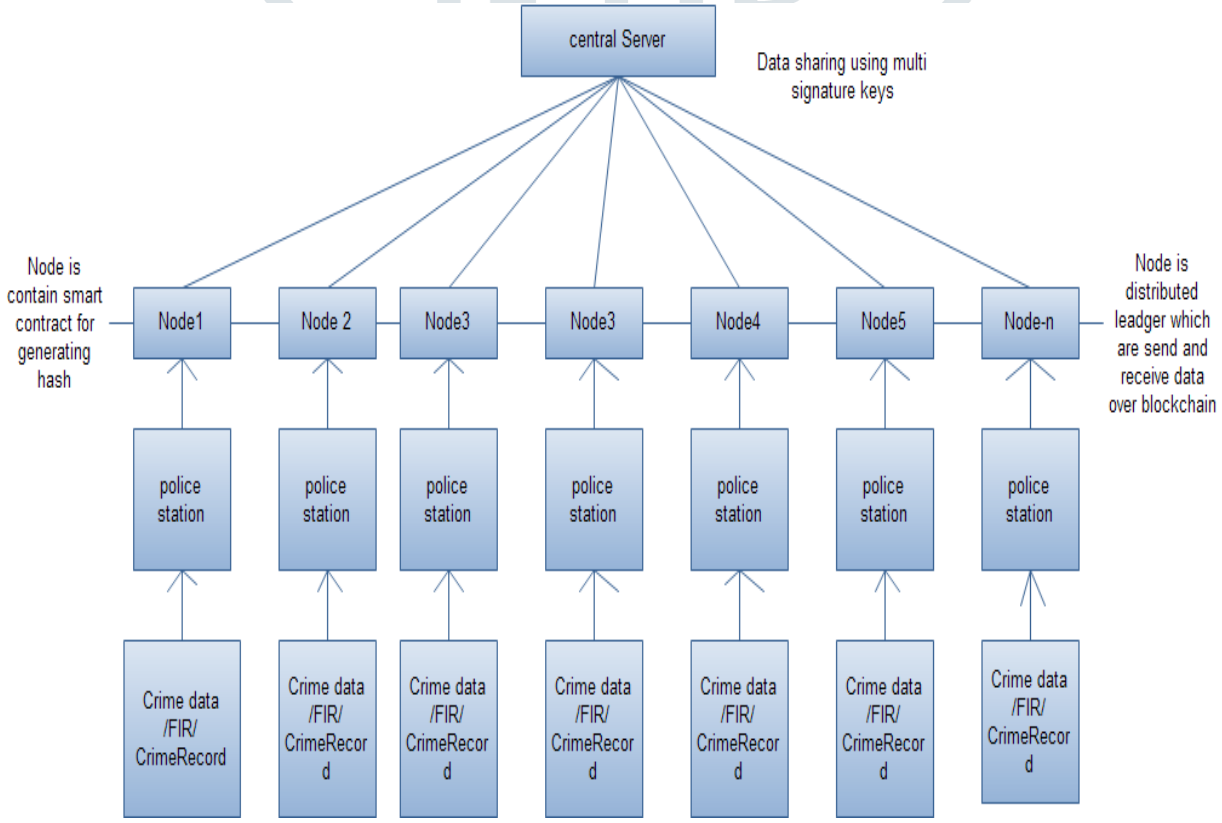
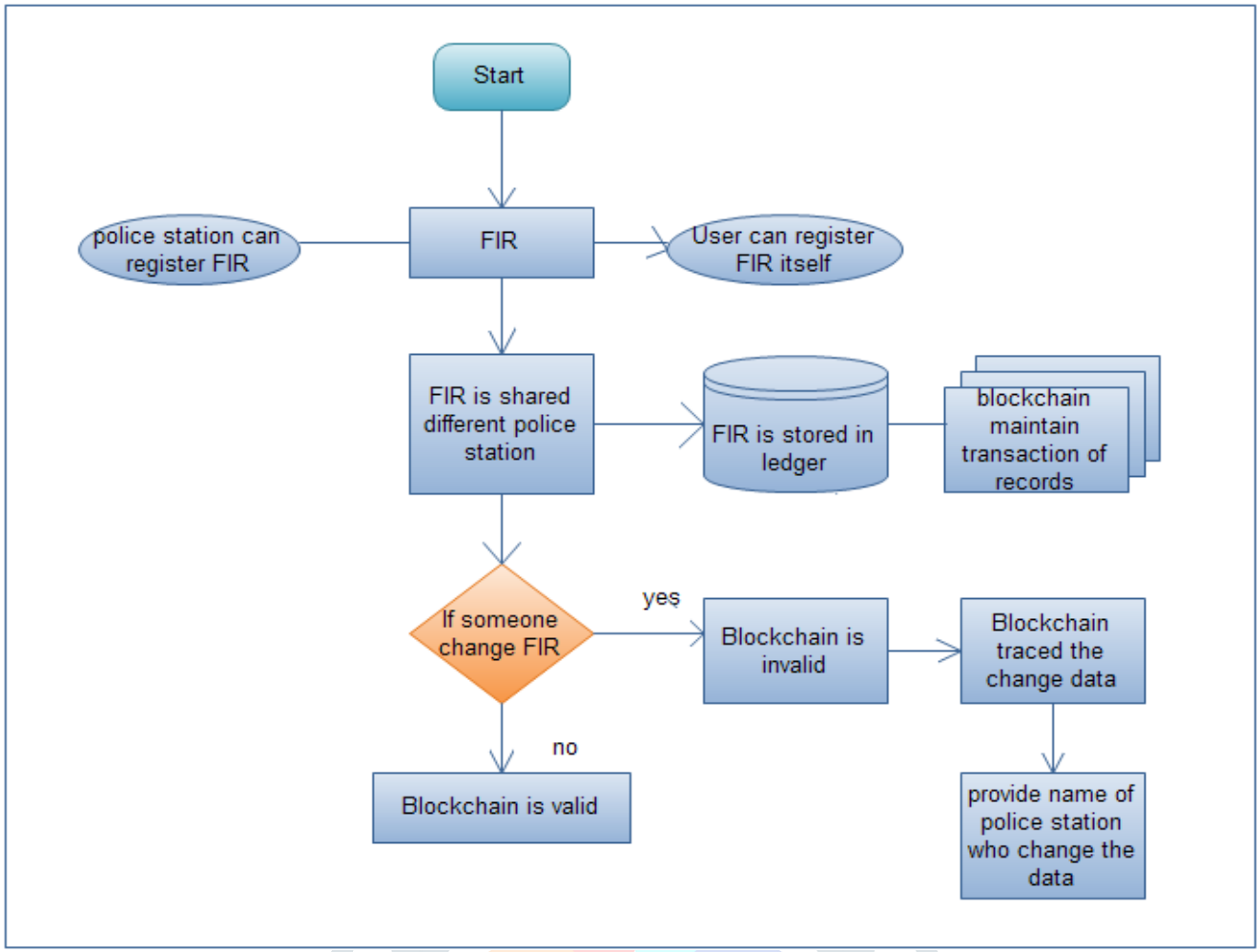


Figure: Advance System Architecture

Police Station: Police stations are blockchain nodes or individual blocks that share and transfer data over the network.Therefore, if anyone tampers with the data in the blockchain, hash function can quickly detect it. Blockchain is a decentralised network with connections between nodes.Police departments communicate information about crimes to other police departments via mail or other unsafe papers, therefore we were added to the blockchain and give it data security.

Flowchart:



Police Station: Police station is node or individual block in blockchain which are share and transmit data over the blockchain network. So if any one can temper the data in blockchain that can easily detect using hash function. Blockchain is distributed network which are connected to each other.

Police station send crime details to another police station through mail or documents which are not safe so we are added into blockchain and provide data security to the blockchain.

3.1.1 Advantages of Proposed system:

- The proposed system will save time.
- Provide the security to the criminal record document.
- Maintain transaction history of criminal record exchange.
- Transactions are maintain trust between two users.
- Fraud control

3.1.2 Algorithms Used:

1 SHA 256

The fact that a hash is a fixed size for any size of source text distinguishes it from encryption because it cannot be reversed to reveal the original text. As opposed to decrypting the text to retrieve the original form, this enables it to be used when it is appropriate to compare "hashed" copies of messages.

2 Message Digest

A cryptographic hash function can generate a message digest from binary datausing the Java MessageDigest class. When you receive encrypted data, it is impossible to tell if it was altered while in transit by looking at the data itself. A message digest can assist in solving that issue. The sender cancreate a message digest from the encrypted data and send it along with the data in order to be able to determine if the data has been altered while in transit. You can calculate the message digest again using the encrypted data once you've received it, and then compare it to the message digest you received along with the encrypted data.

IV. RESULTS AND DISCUSSION

Experimental Set Up

The experimental evaluation is carried out to check the proposal **system** performance. The system it does not require any specific hardware to perform; any standard machine is able to run the application. The data required for the project details was obtained from construction sites nearby.

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ACKNOWLEDGMENT

Blockchain is a technology that synthesizes cryptographic algorithm, hash chains and consensus mechanism, and it can be used to provide services such as consensus, irreversibility traceability for online data. Based on these services, In this project, we are secure data over blockchain network in police departments. Criminal records and history are sensitive records so sharing them over internet is risky so we are use blockchain for data security over distributed network..

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