EVIDENCE PROTECTION SYSTEM USING BLOCKCHAIN TECHNOLOGY

Prof..Ms.V.N.waghchoure,

Jayshri Anil Bachhav, Pawar Vaidehi Dhiraj, Vedashri Prabhakar Gavali,

Samruddhi Prabhakar niphade.

[1] *pawarvaidehi43@gmail.com, Student of Poly. Dept. of Computer Technology K.K.Wagh Polytechnic, Nashik, India*
[2] *vedashrigavali500@gmail.com, Student of Poly. Dept. of Computer Technology K.K.Wagh Polytechnic , Nashik, India*
[3] *Samruddhiniphade387@gmail.com, Student of Poly. Dept. of Computer Technology K.K.Wagh Polytechnic, Nashik, India*
[4] *jayubachhav2608@gmail.com, Student of Poly. Dept. of Computer Technology K.K.Wagh, Polytechnic India*
[5]*Internal Guide Dept. of Computer Technology K.K.Wagh, Polytechnic Nashik, India*

Abstract - The project's main goal is to integrate blockchain technology within the law enforcement chain of evidence—which is essentially a supply chain for gathering evidence—in an efficient manner. The words "supply chain" and "chain of custody" are used interchangeably by the project's writers and researchers. aims to address the issues with the traditional chain of custody such as evidence loss, theft, tampering, and, worst of all, evidence manipulation within the evidence management system by implementing a blockchain-based evidence management system. Blockchain technology can shield wrongfully targeted defendants and police officers from chain of custody problems that could result in false imprisonment for defendants and, worse, wrongful firing for cops. The specific difficulties associated with keeping evidence on a blockchain will be discussed in this project.

***Key Words*:** Block chain, Machine learning

1. INTRODUCTION

Blockchain technology is a decentralized and secure system that can provide tamper-proof evidence protection. It is a distributed ledger that records transactions across a network of computers, ensuring the integrity and authenticity of the data. With the rise of digital evidence such as electronic documents, images, and videos, there is a need for a secure and reliable evidence protection system that can store, track, and verify digital evidence. This paper proposes an evidence protection system that utilizes blockchain technology to secure and authenticate digital evidence. The proposed system will enable easy and secure storage, retrieval, and sharing of evidence for legal, investigative, and historical purposes. The use of blockchain technology will provide a robust and tamper-proof framework for evidence protection, ensuring that the integrity and authenticity of digital evidence are not compromised.

Blockchain is an assortment of squares which are connected, that contains and tracks generally that occurs on a conveyed framework. Because of its dispersed nature, it has supplanted customary stages. Blockchain innovation is used in various evidence of idea executions, models and application frameworks. In this powerful time, there are constant cybercrimes occurring, so there is fundamental job of advanced proof to check the confirmation of beginning and verification of connection associated with cybercrimes. There is parcel of difficulties with online proof. The guardianship chain can be portrayed as a framework used to hold and record the authentic history of advanced proof taking care of. Electronic Forensic confirmations goes through different degrees of ordered progression, that is from the lower mindful substance to the higher dependable substance for dealing with cybercrime examinations. There is generally an intricate advance of break of trustworthiness and disavowal during this exchange of computerized confirmations. The requirement for the hour is to have a framework that guarantees responsibility, unwavering quality, security and capacity of review.

Evidence protection is critical in the field of forensic science. Main concerns in forensic investigation are the management of evidences and their documentation. Starting from the point of collection till the final judgment from the court of law, maintaining the integrity of the evidence is of utmost importance. The evidence protection system using blockchain technology is a tamper-proof and secure system that provides a distributed ledger to store and manage digital evidence. The system utilizes the blockchain's decentralized and immutable nature to ensure the authenticity and integrity of digital evidence, protecting it from manipulation and ensuring that it remains admissible in court. This system allows authorized users to upload digital evidence to the blockchain network. The evidence is encrypted and then stored on the blockchain network as a block.

This system is responsible for verifying the authenticity and integrity of the uploaded evidence. The system uses cryptographic algorithms to verify that the digital evidence has not been tampered with since it was uploaded. This system is responsible for controlling access to the digital evidence. Access to the evidence is strictly controlled, and only authorized users can access the evidence. This system monitors the evidence's movement and provides a transparent audit trail of who accessed the

evidence and when. The system ensures that the evidence chain of custody is maintained. Evidence protection system using blockchain technology provides a secure and tamper-proof mechanism for storing and managing digital evidence. The use of blockchain technology ensures the authenticity and integrity of the digital evidence, providing a viable solution to the challenges of digital evidence protection.

2. USER CLASS AND CHARACTERISTICS

•Admin
1. Manage Users:
The admin can add, update, delete or view users.
They can assign roles to the user – Forensic, Evidence Room, Police.
2. View Evidence:
The user can view various evidence by searching the evidence Id. They can view Evidence details. They can view Logs. If at any place the evidence details don't match, e.g., at the evidence room level or movement level, the admin will get to know the status of where exactly the link is broken using blockchain technology.

•Forensic
1. Login:
The Forensic staff or officer can log in using their credential.
2. Manage Evidence:
They can add, update, delete or view any evidence. They have to add details, type, date and time as well. They also have to add the name/Id of the Investigating and Forensic Officer.

•Evidence Room
1. Login:
The staff at Evidence Room can log in using their credentials.
2. Search Evidence:
They search for evidence through evidence Id. They can add a log of entry or exit. They can also add item count, size, details, etc. They also need to add the Name/Id of the Officer who is taking or storing the Evidence and the Name/Id of the Evidence room officer.
3.View Logs:
They can view the logs by searching Evidence Id or Date.

•Police
1. Login:
The Police Officers can log in using their credentials.
2. .Search Evidence:
They can search for evidence through evidence ID. They can add logs of the movement. They can also add item count, size, details, etc. They will need to add the Source and Destination along with the date and time. They also have to add the assigned officer's Name/Id.

3. MODULE DESCRIPTION

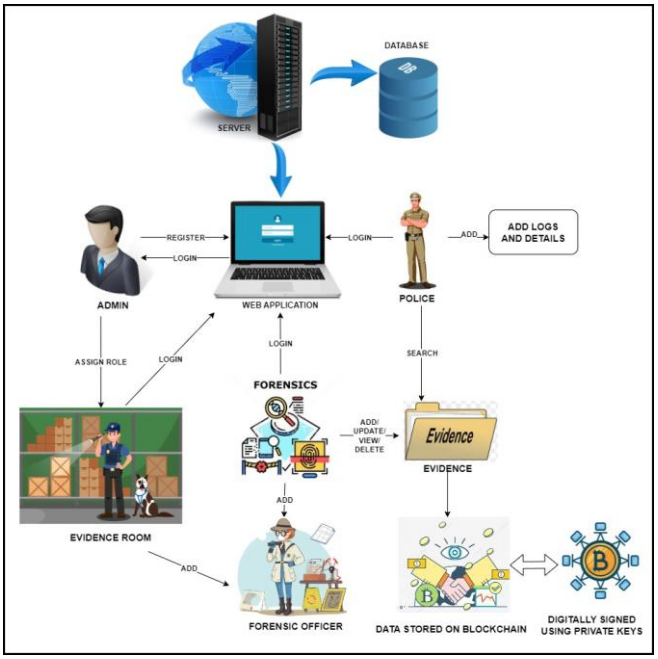

Fig 3.1 System Architecture

This is a Blockchain-based project with 4 modules – Admin, Forensic, Room and Police. The admin can manage users and assign them roles like Forensic, Evidence Room and Police. They can view the details of different evidence by searching the evidence IDs. They can view the log. If at any place the evidence details don't match, for e.g. At the Evidence Room Level or Movement Level, the admin will get to know the status of exactly where the link is broken using blockchain technology. The Forensic staff can access the system by logging in. They can add, update, delete or view evidence along with the details, date, time and type. They can also add the name and ID of Investigating Officer and Forensic Officer. The staff at the Evidence Room can access the system by logging in. They can search for any evidence through evidence ID. They can add an entry and exit log along with item count, size, details, etc. They have to add the name or ID of the Officer who is taking or storing the evidence and of the Evidence Room Officer. They can also view the log by searching Evidence ID or date. The Police can access the system by logging in using their credentials. They can search for any evidence through evidence ID. They can add logs of movement along with item count, size, details, etc. They also have to add the source, destination, date and time. They will also need to add the assigned Police Officer's name and ID.

3. PROJECT METHODOLOGY

- First you must define the problem. This step sounds obvious, but often, you can notice that something is a miss in project or process without really knowing where the core problem lies. The most challenging part of the problem solving process is uncovering where the problem originated.
- Second,you work to generate alternatives to address the problem directly.This should be a collaborative process to ensure you're considering every angle of the issue.
- Third, you evaluate and test potential solutions to your problem.This step helps you fully understand the complexity of the issue and arrive at the best possible solution. Finally,fourth,you select and implement the solution that best addresses the problem. Efficiency issue in problem solving Many time number of processor is less than input of problem.Speedup is greater then processing elements. Size of problem is greater than processing element.

4. GUI/WORKING MODULES

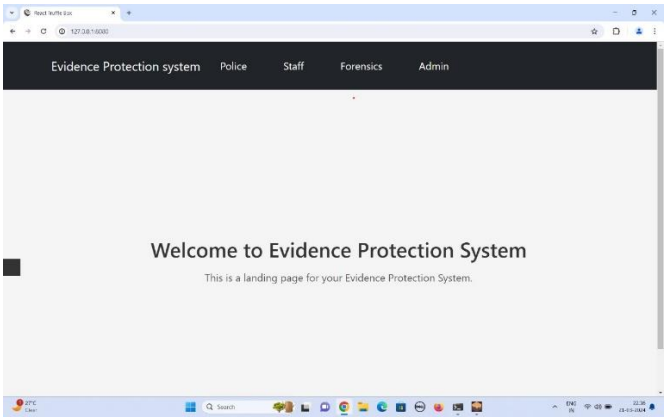

Fig4.1 : 1

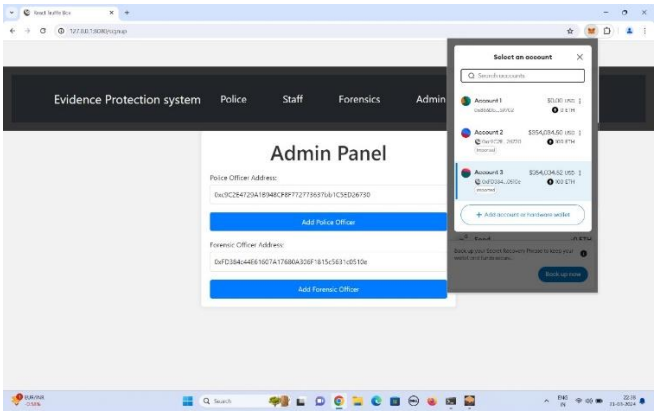

Fig4.2 : 2

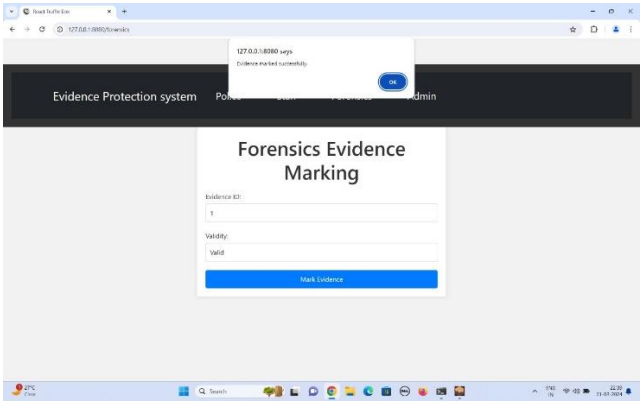

Fig4.3 : 3

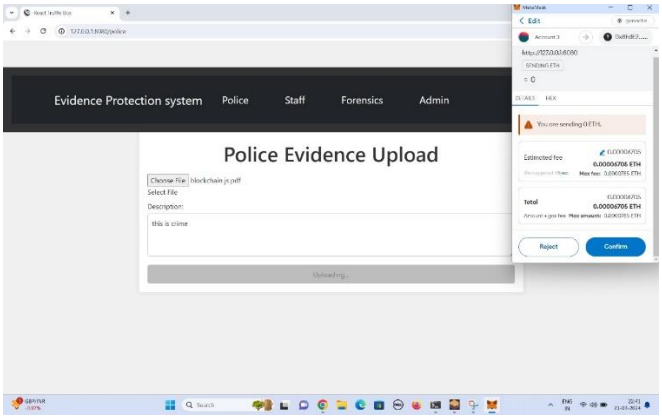

Fig4.3.4: 4

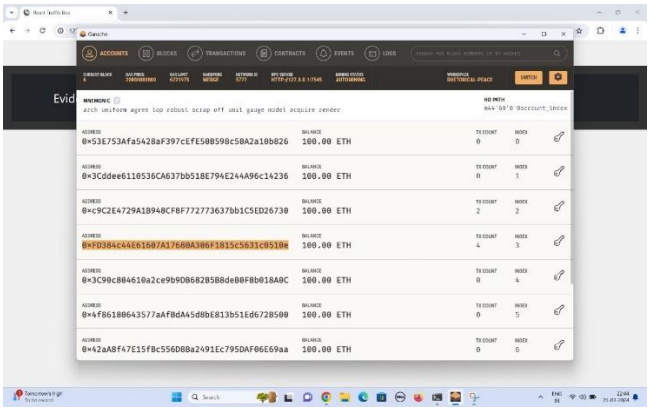

Fig4.3.5:5

5. CONCLUSIONS

The use of blockchain to enhance the integrity of evidence in the criminal justice system is vitally important and just makes sense. It can be an inexpensive and comprehensive solution allowing agencies to continue using all of their existing products while removing most elements of human error and criminal intent from the process. Alister Inc. and LOCARD.EU plan to implement blockchain in the chain of evidence to help restore the public trust in the criminal justice system. Through blockchain, the verified tracking of evidence within different law enforcement agencies will be possible. Only hashes proving the physical evidence “state” will be registered within the system allowing for better and faster processing and more

digital storage space. The attribution of hashes to physical pieces of evidence will allow for immutable tracking of evidence from scene to court, and this system will allow for inadmissible evidence to be easily dismissed in a timely manner. Through the unfortunate cases that have been described above, the authors and researchers from Alister Inc. hope to give their readers a firm grasp of the importance blockchain will have within the justice system, and the many ways it will support the fight toward a more just and accurate criminal evidence tracking system. Accurate evidence with proven integrity is critical in maintaining due process within the judicial system worldwide, and using blockchain to track it can help decrease the instances of political turmoil due to false arrests and convictions. If fail to correct this systemic problem within our criminal justice system, will all suffer the loss of many hard-working, honest, and falsely accused Americans who might have been an excellent Police Officer, or the next great Doctor, Lawyer, Researcher, or Inventor. Simply can't afford not to change, and blockchain in the supply chain of evidence is the change need to implement.

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