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# Image Chaining Through Cryptography and Blockchain

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**ABSTRACT:** Blockchain is a breakthrough technology used to create distributed databases. The data are stored in the form of a chain that grows incrementally, and the information, once saved, is immutable. Each block of data is connected to the previous one with a cryptographic hash function to ensure the integrity and prevent tampering with data (in fact, modifying even a single bit in the chain would require recomputing all hashes from the altered block to the last one, which is a power-consuming task). Our modern world has witnessed a revolution in digital information, which has had an impact upon our societies and lives. On the other hand, many challenges have arisen embedded in the easy access for this information and revealing them, especially if we know that part of them is very important and needs protection as well as secrecy for various reasons. For protecting most of such information and data, which require secrecy, the need for inventing protection systems has become necessary, amongst them our research that deals with the studying and constructing a proposed system for this task.. Here we will use images that will use cryptography and blockchain for image security and privacy. Inspired by the effectiveness of emerging blockchain technology, a security framework, image chain is proposed to ensure the security and privacy of the sensitive images. The practical challenges associated with the proposed framework and further research that is required are also highlighted.

**KEYWORDS:** Encryption, Decryption, Data-hiding, Smart Contract, Steganography.

## I. INTRODUCTION

Blockchain is a distributed database with decentralised, traceable, non-tamperable, secure and reliable features. It integrates P2P (Peer-to-Peer) protocol, digital encryption technology, consensus mechanism, smart contract and other technologies together. Abandoning the maintenance mode of the traditional central node and adopting the method of mutual maintenance by multiple users to realize the information supervision among multiple parties, thereby ensuring the credibility and integrity of the data.

As a representative of distributed databases, blockchain stores all user transaction information on the blockchain, which has high requirements for the security performance of blockchain. Blockchain is a decentralized peer-to-peer network. Nodes do not need to trust each other and there is no central node. Therefore, transactions on the blockchain also need to ensure the security of transaction information on unsecured channels and to maintain the integrity of transactions. It can be seen that cryptography technology occupies the most central position in the blockchain. In blockchain, cryptography technology is mainly used to protect user privacy and transaction information, and ensure data consistency, etc. This paper briefly introduces the cryptographic techniques such as hash algorithm, asymmetric encryption algorithm and digital signature, also elaborates the blockchain infrastructure, the blockchain structure, explains how cryptography technology protects privacy and transaction maintenance in the blockchain in detail.

## II. LITERATURE SURVEY

### 1. Renjith V. Ravi, S. B. Goyal, Chaman Verma "Image Encryption Using Block Chain and Chaos for Secure Communication"

In the present decade, images have become a valuable source of information. They play an essential role in medical, the defence, engineering, and other fields. As a result, image information security is a pressing concern. Over the past few years, blockchain has received a lot of attention in the context of trust difficulties and the removal of third parties. The article that follows offers a blockchain-based image encryption approach. The image is encrypted and the values are

stored on the blockchain using the suggested technique. In transmission, the blockchain assures confidentiality and anonymity. On the basis of NPCR, UACI, and information entropy evaluation, the robustness of the proposed approach has been assessed against differential assault. Entropy analysis is used to illustrate the strength of the system against a brute force assault. The result came close to the optimal value of 8. The suggested method is also demonstrated to be effective in preventing data loss during transmission.

## 2.Prince Waqas Khan and Yungcheol Byun“ A Blockchain-Based Secure Image Encryption Scheme for the Industrial Of Things“

Smart cameras and image sensors are widely used in industrial processes, from the designing to the quality checking of the final product. Images generated by these sensors are at continuous risk of disclosure and privacy breach in the industrial Internet of Things (IIoT). Traditional solutions to secure sensitive data fade in IIoT environments because of the involvement of third parties. Blockchain technology is the modern-day solution for trust issues and eliminating or minimizing the role of the third party. In the context of the IIoT, we propose a permissioned private blockchain-based solution to secure the image while encrypting it. In this scheme, the cryptographic pixel values of an image are stored on the blockchain, ensuring the privacy and security of the image data. Based on the number of pixels change rate (NPCR), the unified averaged changed intensity (UACI), and information entropy analysis, we evaluate the strength of proposed image encryption algorithm ciphers with respect to differential attacks. We obtained entropy values near to an ideal value of 8, which is considered to be safe from brute force attack. Encrypted results show that the proposed scheme is highly effective for data leakage prevention and security.

### III. PROBLEM STATEMENT

Integrity and security of information has become a major concern. Steganography is a technique of hiding information within other data such that the very existence of the message is concealed. This technique can be used to prevent unauthorized access to information and to ensure the security of the message being transmitted.

The aim of this project is to implement image steganography with blockchain framework, which involves hiding information within a image file and chaining the images using blockchain. The challenge in this project is to develop an algorithm that can embed the information within the image without degrading the quality of the image or making the hidden information easily detectable. The algorithm should also be able to retrieve the hidden information from the image file with high accuracy from blockchain. Blockchain makes images immutable and trustworthy.

This project describes the basic concept of steganography and an image chain together with blockchain smart contracts. It can be used in various applications and help many sectors for Image and Data security.

### IV. PROPOSED SYSTEM

#### Module 1: Inserting the image

Open Cv library can be used to perform insertion operations of images which helps to take aimage as input . Only one image can be inserted at one time.

Steps:

Image file name with the image format should be given as input.

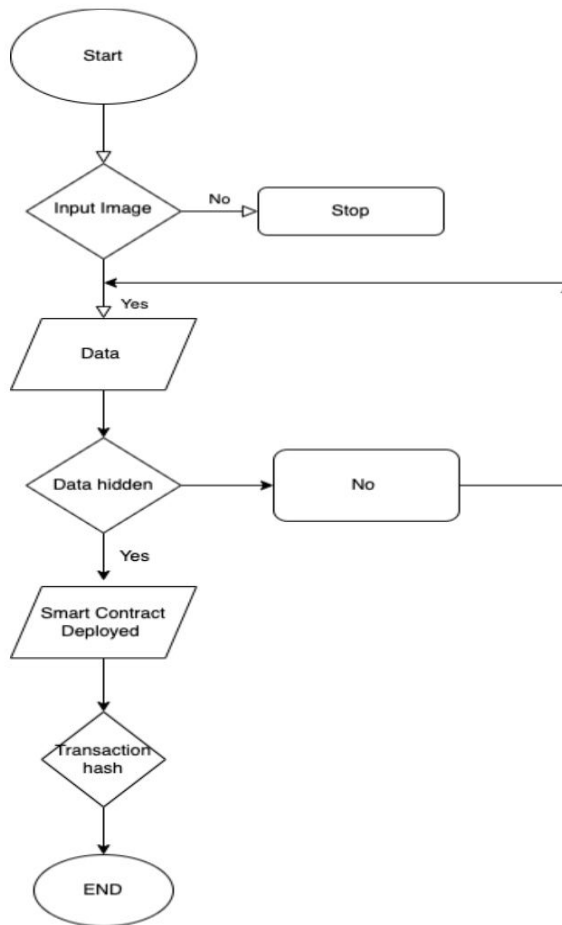
#### Module 2: Secret Data Encryption

Data which is written in image gets hidden through the process of cryptography .Cryptographyprotects information by transforming it into an unreadable format.Itis useful to achieveconfidential transmission over a public network.The original text, or *plaintext*, is converted into a coded equivalent called *ciphertext* via an encryption algorithm. Only those who possess a secret key can decipher (*decrypt*) the ciphertext into plaintext.

**Module 3:** Embedding smart contract

In this step, Remix IDE is used to write solidity code. Smart contracts are simply programs stored on a blockchain that run when predetermined conditions are met. They typically are used to automate the execution of an agreement so that all participants can be immediately certain of the outcome, without any intermediary’s involvement or time loss. They can also automate a workflow, triggering the next action when conditions are met.

**V. METHODOLOGY**



**VI. CONCLUSION**

ImageChain is a new method of linking digital images with hash through the process of Steganography and Smart contracts as blockchain. The main advantage of the proposed solution is that data blocks are stored directly in images. We can store Important Information and then link images with hash transactions of blockchain.

This process has many applications, especially the medical system and security system for storing important information needed. This system process is new and unique. Also this system has a huge trust ratio because it uses cryptography and blockchain combination of implementation.

The Army and Doctor can use this process for securing important information and studies suggest there is a huge application where it can be used.



## VI. FUTURE SCOPE

Image Chain uses Blockchain technology to solve the exponentially growing problem of storing medical imaging data in a secure, accessible and useful way. Our platform will empower patients by giving them full control of their imaging data in one central place. Patients can then grant permission for a set period of time to healthcare agents like clinicians and hospitals to view their imaging when required. By utilizing Blockchain, patients will be able to see who has accessed their data in a completely transparent manner on an immutable record.

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