

AN EFFICIENT APPROACH TOWARDS FAKE PRODUCT IDENTIFICATION USING BLOCKCHAIN

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ABSTRACT

Anti-counterfeiting using blockchain technology is a method of preventing the production and sale of fake products by creating a secure and immutable ledger of transactions that cannot be tampered with. Abstract is a type of product that can be vulnerable to counterfeiting, especially if it is a high-value item or a product that is in high demand .In using blockchain technology, manufacturers of abstract products can create a secure and transparent system for tracking the production, distribution, and sale of their products. Each product can be assigned a unique digital identity that is recorded on the blockchain, and this identity can be used to track the product. When a product is manufactured, its digital identity is recorded on the blockchain, along with information such as the date of production, the location of the manufacturing facility, and any other relevant details. As the product moves through the supply chain, each transaction is recorded on the blockchain, creating an unalterable record of the product's history. A customer purchases an abstract product, they can verify its authenticity by scanning the product's QR code or other unique identifier. This will allow them to access the product's history on the blockchain and verify that it has been manufactured and distributed by the legitimate manufacturer. The products can protect their brand

reputation and ensure that customers are receiving genuine products. Additionally, this technology can also help to reduce the amount of fraud and counterfeiting in the market, which can have a positive impact on the entire industry.

I. INTRODUCTION

The issue of counterfeit products is a significant problem that affects businesses and consumers worldwide. Counterfeiters often attempt to mimic the appearance and packaging of genuine products in order to deceive customers into buying fake goods. This can lead to a loss of revenue for legitimate businesses and potentially harm the reputation of their brand.To use blockchain technology to create a secure and transparent system for tracking the production, distribution, and sale of products. By using blockchain, manufacturers can create an immutable ledger of transactions that cannot be tampered with, ensuring that all products can be traced back to their original source.

In this blockchain technology can be used to combat counterfeit products for a wide range of products, including abstract goods. The process of using blockchain to prevent counterfeit goods is straightforward. Each product is assigned a unique digital identity that is recorded on the blockchain, and this identity is used to track the product through the supply chain. The authenticity of their goods, providing customers .

II. LITERATURE SURVEY

- 1) We propose the block-supply chain, a new decentralized supply chain that detects counterfeiting attacks using blockchain and Near Field Communication (NFC) technologies.
- 2) In order to solve the problems of centralized anti-counterfeiting system and illegal merchants copy authentic commodities at low cost and with low difficulty. This paper proposes an anti-counterfeiting system design based on the combination of blockchain and NFC tag.
- 3) This article presents an Internet-of-Things (IoT) anti-counterfeiting system that uses visual features combined with the quick response (QR) code. The visual features guarantee the authenticity of a product with the QR code for tracking and tracing.
- 4) This paper designs and implements an anti-counterfeiting traceability system based on micro-service architecture, in which each service is independent and has a single responsibility.
- 5) The rapid growth of internet access has given rise to a digital era. The availability of internet access has pushed almost 70% of the population to switch to internet for their daily needs and accessories.
- 6) In recent years, counterfeit products have played an important role in the product making industry. It has also affected the company's brand, sales, and profits. Blockchain technology is now being used to identify authentic products and detect counterfeits.
- 7) Fake review detection and its elimination from the given dataset using different Natural Language Processing (NLP) techniques is important in several aspects. In this article, the fake review dataset is trained by applying two different Machine Learning (ML) models to predict the accuracy of how genuine are the reviews in a given dataset.
- 8) The blockchain paradigm when coupled with cryptographically-secured transactions has demonstrated its utility through a number of projects, with Bitcoin being one of the most notable ones. Each such project can be seen as a simple application on a decentralized, but singleton, compute resource.
- 9) This paper continues our work on the anticounterfeiting system applying phosphor

unlovable function (PUF). An offline anti-counterfeiting system is proposed in this paper prevailing over the previously proposed online system as it does not require any online database.

- 10) In this paper, a new security mechanism is proposed, which consists of a lightweight three-flight mutual authentication protocol and an anti-counterfeit tag design. The proposed solution is based on combining the Rabin public-key encryption scheme with physically unclonable functions (PUF) technology

III. EXISTING SYSTEM

The existing system is fast expansion of internet connectivity has ushered in a digital era. Because of the availability of internet connectivity, about 70% of the populace has switched to the internet for their everyday requirements and accessories. E-commerce platforms, in particular, are being used at a far larger rate than ever before. Individuals who buy from these e-commerce sites rely their choice on whether or not to buy a product completely on the ratings and reviews supplied by these platforms. Because of the simplicity of this review system, sellers and even individuals try to take advantage of it by submitting dishonest evaluations in order to either enhance or damage its ratings. These phoney reviews are intended to deceive customers and persuade them to buy or avoid a certain product. Because there is no effective mechanism in place to distinguish between authentic and fraudulent reviews, these spams manage to get to the top. To prevent this difficulty and give a more effective manner of filtering and reviewing. This work focuses on developing a machine learning model for detecting false reviews and comparing the effectiveness of three distinct techniques. The random forest method outperforms the other two algorithms as a consequence of this research. Based on the rating, a web-based User Interface (UI) is built to eliminate bogus reviews and present trusted reviews.

DISADVANTAGE

- Blockchain technology can be complex, and implementing an anti-counterfeiting system using blockchain requires specialized knowledge and skills. This can make it challenging for some

manufacturers to implement the system without outside help, which can add to the cost.

- While blockchain technology is well-suited to creating a transparent and secure record of transactions, it may not be as well-suited to managing large volumes of data. As the number of transactions on the network grows, the size of the blockchain can become unwieldy, potentially affecting system performance.

IV. PROPOSED SYSTEM

Counterfeiting is a significant problem for manufacturers, retailers, and consumers, resulting in lost revenue, damaged reputations, and potentially harmful products. One proposed solution to this problem is the use of blockchain technology, which provides a secure and transparent way to verify the authenticity of products throughout the supply chain. The proposed system would involve labelling each genuine product with a unique identifier, such as a QR code, that can be scanned to access a record on the blockchain containing information about the product's origin, manufacturing date, and distribution history. A blockchain network would be set up to record transactions related to the product, and smart contracts would be used to automatically verify the authenticity of the product when it is scanned. Data analytics tools would be used to monitor the network for unusual activity, and collaboration and education efforts would be necessary to ensure the system's effectiveness.

By using blockchain technology, manufacturers can provide a secure and transparent way to verify the authenticity of their products, which can help to prevent the distribution of counterfeit goods and protect the revenue and reputation of the manufacturer. This system can also provide consumers with greater confidence in the products they are purchasing and help to ensure that they are not inadvertently exposed to potentially harmful counterfeit products.

BLOCKCHAIN

A blockchain is simply a digital record of transactions that is replicated and distributed throughout the blockchain's complete network of computer systems. Each block on the

chain comprises a number of transactions, and whenever a new transaction happens on the blockchain, a record of that transaction is added to the ledger of every participant. Distributed Ledger Technology refers to a decentralised database administered by several individuals (DLT).

A blockchain is a growing collection of documents known as blocks that are connected together via encryption. Each block contains the preceding block's cryptographic hash, a timestamp, and transaction data (generally represented as a Merkle tree). A blockchain is designed to be resistant to data alteration. This is due to the fact that once data is captured, it cannot be changed retrospectively without affecting all following blocks. A blockchain is often administered as a distributed ledger by a peer-to-peer network that adheres to a protocol for inter-node communication and verifying new blocks. Although blockchain records are not unchangeable, they are secure by design and represent a distributed computing system with strong Byzantine fault tolerance. The blockchain has been characterised as "an open, distributed ledger that may efficiently and permanently record transactions between two parties."

Using blockchain technology for counterfeit or fake products can be an effective way to combat the issue. By creating a secure and tamper-proof ledger, blockchain can help verify the authenticity of products and prevent fake products from entering the market. To use blockchain technology for this purpose is to create a unique digital identity for each product. This digital identity can contain information about the product, such as its origin, manufacturing process, and distribution history. By using a blockchain-based system, this information can be stored in a decentralized and transparent manner, which can be easily verified by consumers, retailers, and regulators. To use blockchain technology for counterfeit products is through the use of smart contracts. Smart contracts can be programmed to automatically verify the authenticity of a product based on predefined criteria, such as its digital identity, shipping and handling, and other factors. This can help prevent counterfeit products from entering the market and provide a reliable way to ensure that consumers are getting the products they expect.

QR CODE

A QR code can be used as a unique identifier for a product that can be scanned to access information about the product's authenticity on a blockchain-based anti-counterfeiting system. The QR code can be printed on the product label, packaging, or directly on the product itself. When a consumer scans the QR code using a smartphone or other device, it would take them to a webpage or app that can interact with the blockchain network. The app would then display information about the product, such as its origin, manufacturing date, and distribution history, which would be stored on the blockchain. The blockchain network would verify the authenticity of the product by checking the blockchain record for the product and verifying that it matches the information on the label. If the product is genuine, the app would provide confirmation to the consumer that the product is authentic. If the product is counterfeit, the app would provide an alert to the consumer that the product is likely fake and provide instructions on what to do next, such as reporting the counterfeit to the manufacturer or retailer. In using QR codes in conjunction with blockchain technology, manufacturers can provide a simple and effective way for consumers to verify the authenticity of their products. This can help to prevent the distribution of counterfeit goods and protect the revenue and reputation of the manufacturer, while also providing consumers with greater confidence in the products they are purchasing.

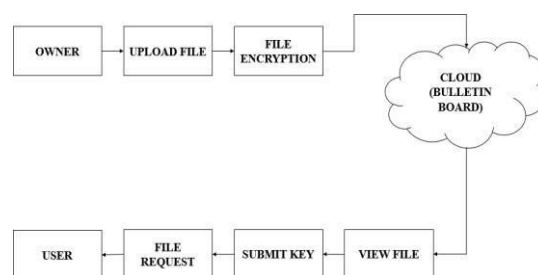
ADVANTAGE

- Blockchain technology provides transparency to the supply chain by enabling participants to view and verify the provenance of products. This feature helps manufacturers track the movement of their products through the supply chain, and enables consumers to verify the authenticity of the product before making a purchase.
- The use of smart contracts that can be programmed to automatically execute certain actions based on predefined conditions. This feature can be used to create contracts that automatically verify the authenticity of a product when it is scanned, and

trigger actions such as refunds or replacements for counterfeit products.

- Blockchain technology provides an immutable record of every transaction that occurs on the network. This means that once a transaction is recorded on the blockchain, it cannot be modified or deleted. This feature helps prevent any tampering with the records of genuine products, ensuring that they are not falsely labelled as fake.

SYSTEM ARCHITECTURE

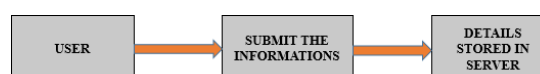


V. MODULE LIST

- Registration
- Login / Logout
- Upload / Download
- Dataset Examination
- Authentication control

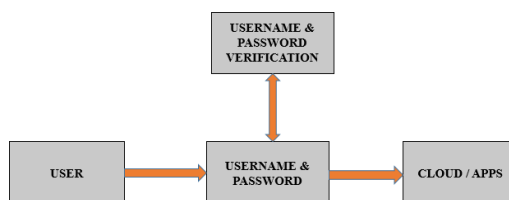
Registration

- The registration module allow the user to create login username and the password by submitting their information like mail id, phone number, name, etc.
- By registering the network or cloud the user can gain access to the resources stored in the cloud.



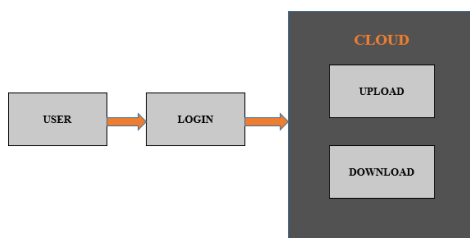
Login / Logout

- In this module the user can login by using their unique username and graphical password.
- The login module verify the user given username and password with the stored username and password in the cloud.
- If the username and password is matched the user can access the resources.
- If it does not match the user does not allowed to access the resource.



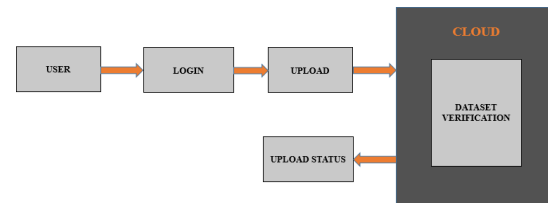
Upload / Download

- In this module the buyer and seller can post the ads and also able to download the data's that are post by other sellers.
- This module is mainly used to upload and also download the big data files.



Dataset Examination

- The data verification is performed in this module. After the upload is successful, the dataset is checked whether a similar dataset has been uploaded before or not.
- If the similar data is already in database the user cannot allow to upload the files in cloud.



Authentication control

- This module is used to control the trade between the sellers and the buyers. It also control the user registration process.
- This module is responsible for the data verification, data encryption, etc.

VI. CONCLUSION

The use of blockchain technology for anti-counterfeiting is a promising solution to combat the growing problem of fake products in the market. By leveraging the decentralized, immutable and transparent nature of blockchain, it is possible to create a tamper-proof system that can verify the authenticity of products at every stage of the supply chain. A blockchain-based anti-counterfeiting system works by assigning a unique digital identity to each product using a blockchain network. This identity is recorded on the blockchain ledger and includes information such as the product's origin, manufacturing date, batch number, and other relevant data. The product's identity is verified by scanning the product's QR code using a smartphone or other device. The verification process checks the product's identity against the blockchain ledger, ensuring that the product is genuine and has not been tampered with. The main advantages of a blockchain-based anti-counterfeiting system is that it provides a high level of transparency and traceability. This means that all parties involved in the supply chain can access and verify the product's information, from the manufacturer to the retailer and even the end customer. This transparency can help to increase trust and reduce the risk of counterfeiting. The use of blockchain technology for anti-counterfeiting is a powerful solution to combat the growing problem of fake products. By leveraging the unique properties of blockchain, it is possible to create a

tamper-proof system that can verify the authenticity of products at every stage of the supply chain, increasing trust and reducing the risk of counterfeiting.

VII. FUTURE WORK

- The integration of blockchain with Internet of Things (IoT) devices can enhance product tracking and monitoring. IoT sensors can be attached to products to collect data on their location, movement, and other attributes. This data can then be stored on the blockchain to create an immutable and tamper-proof record of the product's journey from manufacturer to consumer.
- Blockchain can be integrated with supply chain management systems to improve product tracking and traceability. This can help reduce the risk of counterfeit products entering the supply chain and ensure that products are being sourced from reputable suppliers.
- Collaboration between countries and international organizations can help create a global anti-counterfeiting network. By using a common blockchain-based system, countries and organizations can share information on counterfeit products and work together to prevent their distribution.

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