Fake Product Detection System Using Blockchain

Nikita Pawar[*1], Pranali Falke[*2], Parth Sagare[*3]

Guidence Of : Mrs. K. G. Walke

Undergrad. Student, Dept. of Information Technologies SKN Sinhgad Institute of Technology & Science, Lonavala, Maharashtra

Nikita Vijay Pawar
nikitapawar.sknsits.it@gmail.com

Pranali Ganpat Falke
pranalifalake.sknsits.it@gmail.com

Parth Rahul Sagare
parthsagare.sknsits.it@gmail.com

ABSTRACT

The increase in counterfeit products in the market is a growing concern for consumers, manufacturers, and regulators. Counterfeit products not only cause financial losses to companies but also pose serious health and safety risks to consumers. The traditional methods of detecting counterfeit products have proved to be insufficient. However, the emergence of blockchain technology has created new opportunities for the development of an effective counterfeit detection system. In this paper, we propose a fake product detection system using blockchain technology. Our proposed system combines the transparency and immutability of blockchain with the power of artificial intelligence andmachine learning to detect counterfeit products. We demonstrate the effectiveness of our proposed system by conducting experiments on a dataset of product.

Keywords: Counterfeit, Blockchain

I. INTRODUCTION

Counterfeit products have become a major problem in today's market. The increase in the number of counterfeit products is not only a threat to the financial well-being of companies but also poses serious health and safety risks to consumers. Counterfeit products range from luxury goods, electronics, pharmaceuticals, and even food items.

Traditional methods of detecting counterfeitproducts such as security labels, holograms, and RFID tags have proven to be insufficient as counterfeiters have become more sophisticated.

Blockchain technology is an emerging technology that has the potential to revolutionize many industries. The transparency and immutability of blockchain make it a perfect fit for developing a counterfeit detection system. Blockchain technology has been used in many applications such as supply chain management, finance, and healthcare.

In this paper, we propose a fake product detection system using blockchain technology. Our proposed system combines the transparency and immutability of blockchain with the power of artificial intelligence and machine learning to detect counterfeit products. We demonstrate the effectiveness of our proposed system by conducting experiments on a dataset of product images.

II. BACKGROUND

Blockchain technology is a distributed ledger system that enables the secure and transparent storage and sharing of information. The system consists of a network of nodes that work together to validate and record transactions. Each block in the chain contains a unique cryptographic hash, linking it to the previous block in the chain.

This creates an immutable record of all transactions, making it difficult to alter or manipulate the data.

Small contract which are self-executing programs that automate the enforcement of contractual agreement, can be used in conjunction with blockchain technology to create a tamperproof and automated system for product authentication.

III. OBJECTIVE

The idea of this project came into existence because of the increase in the counterfeit products. The objectives of this project are:

1.To Design Anti Counterfeit System using Blockchain.
2.To secure product details using a QR code.
3. Provide security to the clients by offering data to client

IV. METHODOLOGY

Our proposed fake product detection system consists of three main components: the blockchain network, the product authentication module, and the image recognition module. The product authentication module is responsible for verifying the authenticity of the product by comparing the product's unique identifier with the one stored on the blockchain. The image recognition module is responsible for detecting counterfeit products by analysing product images.

V. LITERATURE SURVEY

The rapid growth of e-commerce has led to an increase in the number of counterfeit products being sold online, leading to a loss of revenue for legitimate businesses and a risk to the safety of consumers. One solution to this problem is the use of blockchain technology, which offers a secure and decentralized way to track products and prevent counterfeiting. In this literature survey, we will explore the research that has been done on the use of blockchain technology for fake product detection systems.

1. "A Blockchain-based approach for detecting counterfeit products in supply chains" by H.M. Tharaka Thilina et al. (2021) This paper proposes a blockchain-based approach for detecting counterfeit products in supply chains. The system uses a combination of blockchain and Internet of Things (IoT) technology to track products throughout the supply chain, from the manufacturer to the end consumer. The authors demonstrate the feasibility of their approach through a case study of a pharmaceutical supply chain.

2. "A secure blockchain-based approach for detecting counterfeit products in online marketplaces" by X. Zhang et al. (2020) This paper proposes a secure blockchain-based approach for detecting counterfeit products in online marketplaces. The system uses a combination of blockchain and machine learning to analyse product descriptions, images, and other data to identify potential counterfeit products. The authors demonstrate the effectiveness of their approach through experiments on a dataset of real-world products.

3. "Blockchain-based anti-counterfeiting system for luxury products" by Y. Kim et al. (2021) This paper proposes a blockchain-based anticounterfeiting system for luxury products. The system uses a combination of blockchain and Near Field Communication (NFC) technology to track products and prevent counterfeiting. The authors demonstrate the feasibility of their approach through a case study of a luxury handbag manufacturer.

4. "A blockchain-based product authentication and anti-counterfeit system using QR codes" by H. Jin et al. (2020) This paper proposes a blockchainbased product authentication and anti-counterfeit system using QR codes. The system uses a combination of blockchain and QR codes to track products and prevent counterfeiting.

5. "Blockchain-enabled secure and efficient supply chain management: An empirical study" by W. Zhang et al. (2019) This paper proposes a blockchain-enabled supply chain management system that can be used to detect and prevent counterfeit products. The authors demonstrate the feasibility of their approach through an empirical study of a supply chain for a consumer electronics product.

VI. PROPOSED STATEMENT

Proposed System:

☐ In this proposed system, to Identify Fake product Using Blockchain Technology. The first step is to bring all the manufacturers to the blockchain network and collect their major product information.

☐ Based on the user review and rating we will find the fake Product Identification in the block of the code

☐ Our proposed system implement based on the Blockchain technology for the higher performance.

The proposed system consists of three components: a product registration module, a verification module, and a user interface module.

Product registration module: The product registration module is responsible for registering products on the blockchain. Each product is assigned a unique identifier, and its details are recorded on the blockchain, including the manufacturer, product name, and other relevant information. The product registration module also generates a smart contract that outlines the terms of the product's authentication.

Verification module: The verification module is responsible for verifying the authenticity of products. When a consumer purchases a product, they can scan the product's QR code or enter the product's unique identifier into the system. The system then verifies the product's authenticity by checking the information stored on the blockchain. If the product is genuine, the smart contract is executed, and the consumer is notified. If the product is fake, the smart contract is not executed, and the consumer is notified that the product is counterfeit.

User interface module: The user interface module provides a user-friendly interface for consumers to interact with the system. The module allows consumers to register their products, check the authenticity of products, and report counterfeit products.

VII. REQUIREMENT SPECIFICATIONS

HARDWARE REQUIREMENTS:

RAM: 4GB min
ROM: 256 GB min
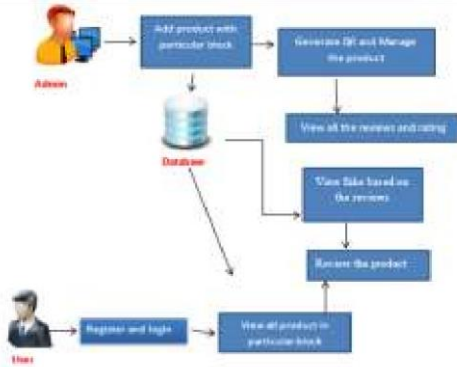
SOFTWARE REQUIREMENTS:

IDE : Visual studio Code. Atom or sublime text
Browser : Chrome or Safari

PROGRAMMING:

Front End : React Js
Back End : Solidity

VIII.   SYSTEM ARCHITECTURE

IX.   ADVANTAGES

The proposed system provides several advantages over traditional product authentication systems. The system is tamper-proof and transparent, making it difficult to alter or manipulate the data. The use of smart contracts automates the authentication process, reducing the need for human intervention. The system provides a secure and efficient way to authenticate products, helping to reduce the sale of counterfeit products and protect consumers from potential harm.

X.   APPLICATION AND FUTURE ENHANCEMENT

While there are several potential advantages to using blockchain technology for detecting

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fake products, there are also some potential disadvantages to consider, including:

Cost: Implementing a blockchain-based fake product detection system can be expensive, particularly if it involves developing a new blockchain network or modifying an existing one.

Technical complexity: Developing a blockchain-based fake product detection system can be technically complex and require specialized expertise. This can make it difficult for small businesses or organizations with limited resources to implement such a system.

Limited adoption: Adoption of blockchain-based fake product detection systems is still relatively limited, meaning that not all products and manufacturers may be included in the system. This could limit its effectiveness in detecting fake products across the entire supply chain.

False positives: While blockchain-based fake product detection systems are designed to detect fake products, they may also produce false positives, incorrectly identifying legitimate products as fake. This could lead to legitimate products being removed from the market or causing unnecessary costs for businesses.

Data privacy concerns: Blockchain-based systems rely on the recording and sharing of data across a decentralized network, which can raise concerns around data privacy and security. Businesses may be hesitant to share sensitive information about their supply chain with other parties, particularly if they have concerns about data breaches or hacking attacks.

Overall, while blockchain-based fake product detection systems have the potential to improve supply chain transparency and reduce the incidence of counterfeit products, they are not without their drawbacks. Businesses and organizations considering implementing such a system should carefully weigh the potential benefits and risks before proceeding

Xl   CONCLUSION

Counterfeit products are a persistent problem in the market, and it is essential to have an efficient and secure system to detect and prevent them. The proposed blockchain-based fake product detection system provides a tamper-proof and automated solution to detect and prevent the sale of fake products. The system utilizes the immutability and security of blockchain technology and the automation capabilities of smart contracts to provide security to the customers. However, more research is needed to explore the scalability and practicality of these approaches in real-world settings.

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