

## FAKE PRODUCT IDENTIFICATION USING BLOCKCHAIN

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**Abstract-** Counterfeiting is a significant problem across various industries, leading to economic losses, risks to consumer safety, and damage to brand reputation. Traditional methods of combating counterfeiting have proven insufficient due to the complexity of global supply chains and the increasing sophistication of counterfeiters. Blockchain technology offers a promising solution by providing a transparent and immutable ledger for tracking products throughout their lifecycle. We present the design architecture, implementation details, and evaluation results of our system, demonstrating its effectiveness in combating counterfeit products.

**Keywords:** Blockchain, Fake Product Identification QR codes, Transparency, Ant counterfeiting, Security.

### 1 INTRODUCTION

Counterfeiting poses a significant threat to both consumers and businesses across various industries. The proliferation of fake products not only results in substantial economic losses but also undermines consumer trust and poses serious safety risks. Traditional methods of product authentication, such as holograms, serial numbers, and QR codes, have proven vulnerable to duplication and tampering, rendering them ineffective in combating counterfeiting effectively. Blockchain makes it possible to create a system for authenticating products throughout their lifecycle, from manufacturing to distribution and consumption. In this paper, we present a novel approach for identifying fake products using blockchain technology. Our proposed system aims to provide a secure, transparent, and decentralized platform for product authentication, thereby mitigating the risks associated with counterfeit goods. Despite these inherent strengths, challenges such as scalability, interoperability, regulatory compliance, and technological integration must be addressed to realize the full potential of blockchain in counterfeit product identification.

A user-friendly interface, whether web-based or mobile, guides users through the process of querying product authenticity and displays clear results. Furthermore, a feedback loop allows users to report suspected counterfeit

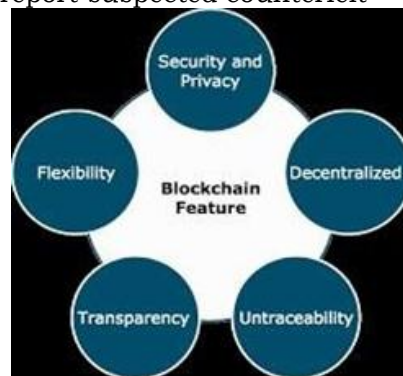


Fig1.1 Features of Blockchain

### 2 LITERATURE SURVEY

Several studies have explored the application of blockchain in counterfeit product identification, demonstrating its potential to enhance traceability. Providing consumers with real-time access to product provenance information. However, challenges such as scalability, interoperability, regulatory compliance, and technological integration remain significant barriers to widespread adoption. This literature review aims to analyze existing research, identify key features and considerations, examine case studies, and propose future directions for leveraging blockchain technology in the fight against counterfeit products. Counterfeit products pose a significant challenge across various industries,

ranging from pharmaceuticals and luxury goods to electronics, resulting in detrimental effects on consumer safety, brand reputation, and economic losses. Traditional methods of product authentication, including serial numbers, and QR codes, have proven to be inadequate in combating the sophisticated tactics employed by counterfeiters. In recent years, blockchain technology has emerged as a promising solution to address this issue.

### Web 3 Provider Algorithm

At the core of this system lies blockchain technology, which provides a secure and immutable ledger for storing product information. Each product is assigned a unique identifier and relevant metadata, such as manufacturer details and distribution history, which are stored on the blockchain. The system also includes a Web 3.0 provider, typically in the form of a decentralized application (dApp) or smart contract, to facilitate user interactions with the blockchain network. This provider receives queries about products and retrieves relevant data from the blockchain. Additionally, identification algorithms play a crucial role in verifying product authenticity by comparing user-provided information, such as serial numbers, with data stored on the blockchain. It is used to detect patterns indicative of counterfeit products large volumes of queries efficiently, while enhancing consumer trust in the authenticity.

### 3 SYSTEM ARCHITECTURE

Our proposed system for fake product identification using blockchain consists of the following key components:

1. Product Registration: Each authentic product is registered on the blockchain at the time of manufacturing. The product information, including its unique identifier, manufacturing details, and any relevant certifications, is recorded on the blockchain.
2. Supply Chain Tracking: As the product moves through the supply chain, relevant stakeholders, such as manufacturers, distributors, and retailers, update its status on the blockchain. This ensures transparency and traceability throughout the product's journey from production to consumption.
3. Verification Interface: Consumers can verify the authenticity of a product using a dedicated verification interface. By scanning a QR code or entering the product's unique identifier, consumers can access the product's blockchain record and verify its authenticity.
4. Smart Contracts: Smart contracts are used to automate certain processes within the system, such as verifying product authenticity based on predefined criteria, executing payments, and managing disputes.

### Implementation

We have implemented a prototype of our proposed system using Ethereum blockchain. Smart contracts are written to handle product registration, supply chain tracking, and verification processes. A user-friendly interface allows consumers to interact with the system seamlessly, enabling them to verify the authenticity of products with ease.

### Implementation Results:

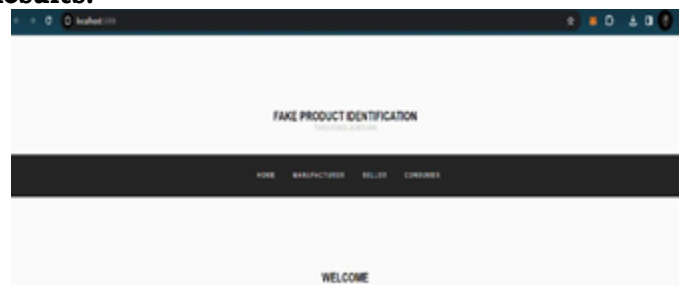


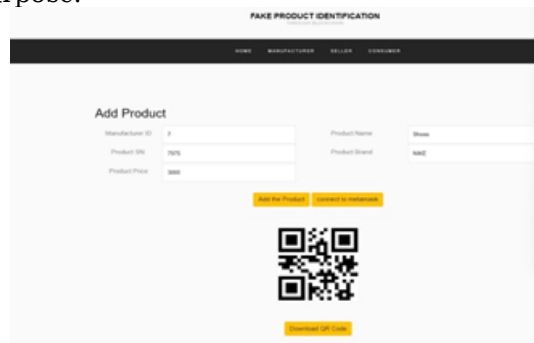
Fig. 5.1 Home Page

The home page of our platform provides a clear introduction service and different sections.



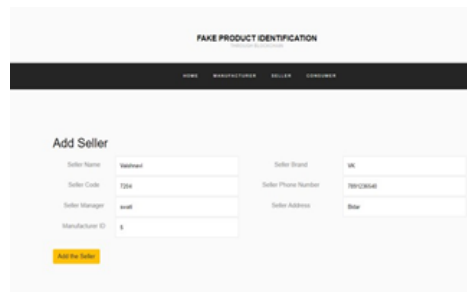
**Fig. 5.2 Ganache Blockchain**

It is a personal blockchain, it provides quick and easy way to setup a personal thorium blockchain for testing purpose.



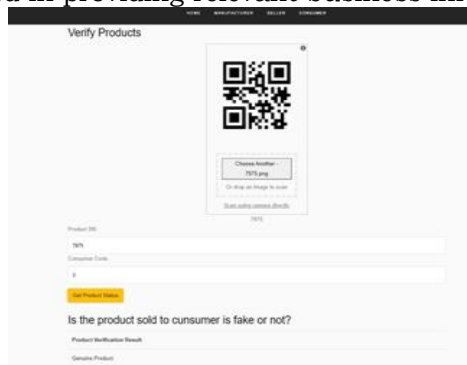
**Fig. 5.3 Product Registrstion**

In product registration, each product is assigned a unique identifier which is registered in block chain.



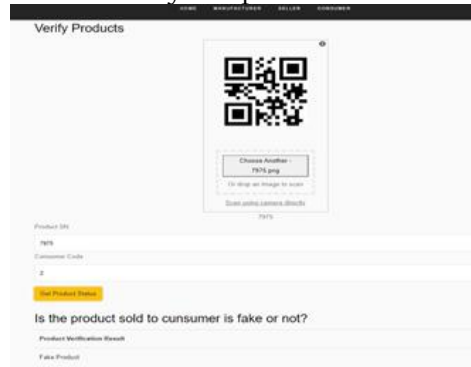
**Fig. 5.4 Seller Registrstion**

Seller registration is involved in providing relevant business information.



**Fig. 5.5 Genuine Product**

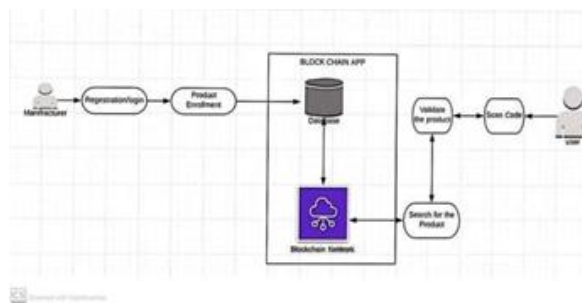
Consumers use this platform to identify the product authenticity.



**Fig 5.6 Fake Product**

It helps the consumer to suspect the product they have purchase.

#### 4 METHODOLOGY

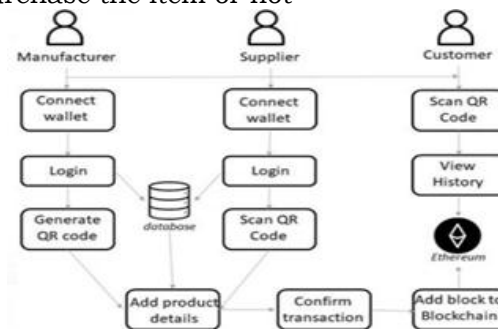


**Fig 6.1 Block Diagram**

Methodology for identifying fake products using block chain entails a multi-step approach aimed at establishing transparency and trust. Initially, each authentic product is assigned a unique identifier during manufacturing, which is then recorded on a block chain ledger along with relevant details. This ledger serves as an immutable record, making tampering with product information virtually impossible. Verification of product authenticity becomes accessible to consumers and through scanning the unique identifier via mobile apps or web interfaces, triggering queries to the block chain for confirmation. This decentralized validation mechanism ensures trust by providing transparent access to product information.

##### 1. User can verify the Product

In this stage buyers can scan QR code allocated to the item utilizing android application. The Scanner scans the product and decrypts the encrypted text in a given algorithm and gets the detail about the product that is the manufacturer and current owner of the product and can conclude if to purchase the item or not



**Fig 7.1 User case Diagram**

## 5 CONCLUSION

This paper is the main Blockchain framework that proposes a completely functional fake item forgery framework. Without paying any transaction charge, clients of our framework at this point should not be worried about the chance of obtaining a counterfeit item. Accordingly, the proposed framework is valuable for end clients to identify counterfeit items in the inventory network. End client can check QR code allotted to an item and can get all the data like exchange history, current proprietor dependent on which end client can check if the item is counterfeited or not. By using blockchain, we're making sure that everyone involved in the process can trust the products they buy and sell. This helps consumers know if what they're buying is genuine and helps companies protect their brands. It also makes it easier for authorities to catch counterfeiters.

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