

Identifying Fake Product Through a QR Code Based Blockchain System

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Abstract - The production and marketing of counterfeit or counterfeit items and products exposes consumers to financial, health and safety risks. It also affects the business growth of companies and businesses through loss of revenue, bad products, losses and price changes, many names are forced to use the money for legal protection. Use camera scanners to identify counterfeit products and link the product's QR code or barcode to blockchain blocks. If the numbers on the work match the numbers in the library, a notification is sent to the customer informing them about the originality of the work. If the customer accepts the offer, a notification will also be sent to the manufacturer stating where the customer purchased the product, if the number on the product does not match the number in the information. This approach aims to reduce counterfeiting by ensuring that consumers do not rely on retailers to decide whether the product is genuine or not. Product tracking using blockchain technology involves creating tamper-proof and immutable information about products from production to delivery. Use blockchain technology for product development to identify and track product information. Check product authenticity by scanning barcodes or QRcodes. This will help you make sure that all items are genuine and have not been altered or replaced with fake items.

Key Words: Block chain

1. INTRODUCTION

A blockchain platform is a shared digital ledger that enables users to exchange information and record transactions in a safe, unchangeable manner. Blockchain is designed to store transactions and pre-agreed rules. Blockchain technology emerged in this context, providing a more traditional and secure concept, bringing many benefits to the entire product lifecycle. The connection between two blocks is made with the SHA-256 algorithm. Product management is a process that transforms raw materials into finished products throughout the supply chain, improves human consumption, reduces operating costs, improves financial performance, etc. It includes the management of products and services, including all processes. in equipment. Tracking is important in service management because it allows you to track the product all the way to the end customer. Product chain traceability provides the opportunity to increase chain efficiency, meet regulatory requirements and, most

importantly, tell our customers the story of the origin and journey of our products. For safety-critical products such as food and pharmaceuticals, the supply chain is traceable. This is very important and has been followed in the business world for many years. Supply chain analysis, although important, is difficult because it depends on many people participating in a collaboration that does not encourage collaboration. Additionally, the lack of a verification process means that participants must provide very little information to ensure chain traceability. In existing studies, researchers focus on the nature of the connectivity between devices, specifically information sharing between different stakeholders. The reasons for the suitability, stability and quality of the control system have not been fully explored. In recent years, blockchain has been viewed as a promising method for chain tracking due to its unique capabilities. It has features such as immutability, transparency, control and native support. Generally speaking, about a blockchain is a list of additional blocks containing various transactions managed by a peer-to-peer network. Information stored in the blockchain system is public and cannot be changed; This ensures the security of stored data. Tracking allows tracking of data items in a block. Additionally, the blockchain itself also features decentralized tokens to encourage collaboration between stakeholders on the chain. Finally, incentivized trust, along with governance, guarantees the traceability of the blockchain chain.

2. PROBLEM STATEMENT

With the increase in international trade and technological progress, the volume and ease of acquisition of imitation products produced have reached a new dimension. It can affect the company's sales, reputation and revenue and cause serious harm to unsuspecting customers. We use blockchain technology system to detect fake products from barcodes - Dotnet project published a report on fake products using blockchain technology.

In this process, we provide a barcode for every particular product from the manufacturer, which contains all the details of that product, and the end user can scan the barcode and get all the information about the product. Users can verify the authenticity of the product after scanning the barcode.

3. WORKING

Our project prepares a simple, accurate and low-cost anti-counterfeiting product. It consists of 2 modules: administrator and users. Administrators will have the right to add, edit, view and delete items. In addition to sales information, product serial number, production date, product history, expiration date, etc. They must also include product information, including Managers can also look for fake notes. Users must register before entering the system. To check whether the product is fake or not, users need to scan the barcode of the product. If the product is detected, the user will be able to see all the details of the product. If the scanned barcode is fake, it will inform the user that the product is fake. If the product cannot be found, the user can send the picture of the product to the administrator as a fake product entry with detailed information. All content here is stored in a block to ensure that no product information is tampered with or changed. This project includes Html, CSS and JavaScript on the front end, and MSSQL on the back end. IDE Visual Studio.

3.1 Block Chain Traceability

Research on chain traceability can be divided into two groups: providing common information representing the various participants in the supply chain and technology that enables data storage to be supported securely and across all locations. Stakeholders have their own information management systems with different types of information. Supply chain traceability requires the provision of information from stakeholders and the need for common information representation. Data integration represents a way of information distribution that has been studied for many years. Bekini et al. Learn about chain traceability issues, introduce product traceability standards and appropriate standards, discuss appropriate standards to set, sign up and learn about partnerships, and use a real-world food chain traceability system. Hu et al. Publish a unified modeling language (UML) model for monitoring and modeling and create a UML class diagram to represent a product, layer standard, and quality data. Conducting supply chain and food chain traceability studies. Digital technology for connected devices is a representation of Radio frequency identification (RFID) and blockchain. Specifically, RFID is a technology that helps collect data on connected devices, while blockchain is a distributed technology that can provide secure and reliable data storage.

3.2 Search by Block Chain

Blockchain-based supply chain traceability requires blockchain data tracing for specific products. In this section, we introduce how blockchain research works. Specifically, blockchain search refers to the process of requesting users

to block all nodes in order to search for block data, Search can be a keyword here Search, many questions, etc. Data integrity, privacy, and performance are three key features of blockchain research. Integrity refers to how the research is conducted and the confidentiality of the research process. advanced communication. The basic process of finding a blockchain is as follows. First, the user sends a request to the block-all button. All points then process the request by scanning the data block blocking through the block and transaction, and record all the satisfactory data for the search. Finally, all nodes return the request. Because the original data is blocked, the integrity of the search cannot be guaranteed and privacy will be leaked, it seems that it takes a lot of time to scan them one by one. The research community has developed solutions to improve integrity, privacy and efficiency. Smart contracts and authentication are two ways to guarantee search results. The main idea behind smart contracts is to send mining requests to all blockchain nodes instead of just one. Blockchain power will ensure integrity by encouraging more blockchain nodes to repeat votes and complete search results. The advantage of using a smart contract is that it is a universal method and can be easily adapted to different documents and requirements. But the downside is the high cost of running a smart contract. For verification purposes, these search results sent to the user will be accompanied by a certificate of authenticity. Using data analytics allows you to adjust performance by fine-tuning data. Comparatively, the weakness is the lack of reliable universal information for all types of data and questions. Searchable encryption is the first way to protect privacy when searching is blocked. Compared to simple search methods, data, requirements and search results are coded. The scientific community has developed effective encryption techniques for various types of data and applications. In summary, existing research on blockchain-based supply chain traceability largely ignores practical issues. When we reduce the blockchain-based chain tracking to the blockchain search problem, we see that the basic picture of the blockchain search problem is new.

4. SYSTEM MODEL

The blockchain-based supply chain system model is explained in detail. In particular, people involved in the supply chain, such as raw materials, factories, warehouses, transportation companies and retailers, form a peer-to-peer network and manage blockchain permission. Regulators can also join and expand blockchain networks. Our system prefers permissioned blockchains over public blockchains because nodes held by participants who do not provide services should be prohibited from participating in the blockchain network. Please note that all stakeholders can contribute to a group of blockchain nodes and the entire blockchain network will be very large. In our system, stakeholders will send product information to the blockchain for the following reasons. First, transparent product information on blockchain will increase consumers' trust.

Second, information sharing helps improve the efficiency of supply chain management. Finally, product information can better meet stringent requirements. Please note that a blockchain system can only ensure that data is not tampered with while it is stored. If a participant provides false information, the blockchain can provide immutable and stable proof of error. They will also be satisfied with the service provided by the supplier for the end customer. Request the product from the blockchain Tracking information.

4.1 Life Cycle

The waterfall model is a linear construction model that uses rigid phases: When one phase ends, the next begins. The steps occur sequentially, and the model does not allow the developer to return to the previous step without making adjustments. The waterfall model is one of the most common and classic life cycle models, also known as the linear sequential life cycle model. It is based on factory assembly line process. All these stages are interconnected, progress seems to flow continuously from stage to stage. Only after the targets set in the previous stage are achieved and signed, the next stage will be moved, hence the name "Waterfall Model". In this model, levels do not overlap.

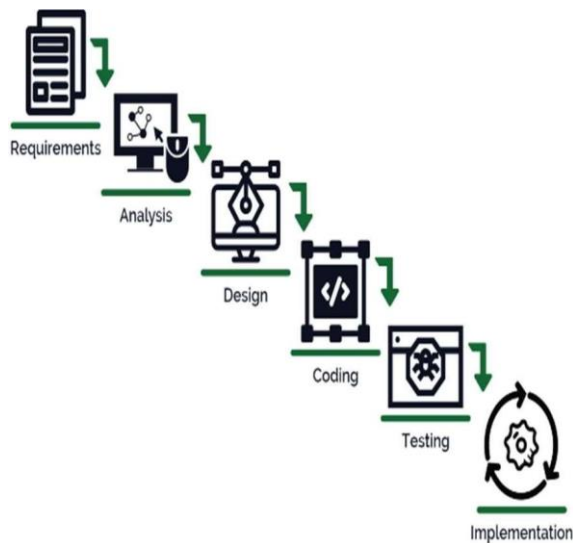


Fig -1: Waterfall model

4.2 Existing Model

Existing systems are more susceptible to counterfeit products entering the market, which can damage brand reputation and customer trust. It can be challenging to track and verify the history and status of a product throughout its lifecycle. The sensitive product data vulnerable to breaches

and cyber attacks. Many traditional systems rely on manual data entry and paperwork, which can be time-consuming and error-prone. Using blockchain technology, there are several methods for identifying fake products. The use of a decentralised ledger system, which provides a transparent and tamper-proof record of transactions, is one of the most common methods. Each product is given a unique identifier, such as a QR code or NFC tag, that is linked to a blockchain record in this method. This document contains information on source material, production and delivery to equipment. Authorized persons, such as customers and regulatory bodies, can access this information to verify the authenticity of the product. Another way is to use smart contracts on blockchain platforms to operate and manage the rights and obligations of the property. For example, smart contracts can be configured to verify the authenticity of the product based on certain conditions, such as the product's expiration date or history. Finally, some blockchain solutions use machine learning algorithms to identify artifacts based on patterns and anomalies in blockchain data. These algorithms can detect and flag potentially disruptive transactions, allowing both parties to respond appropriately.

Disadvantages : Weak Security, Data Entry is restricted , Inefficient.

4.3 Proposed Model

Since people often shop from remote areas, there is a risk of purchasing counterfeit products. Such fake products harm customers and the company's reputation. They will suffer serious damage as a result. There is no solution unless this problem is solved. Since barcodes can be easily read, there is no guarantee or effective solution to distinguish fake products from original products. Blockchain is the most promising emerging technology in recent years that can assist in the resolution of this type of problem. Blockchain technology can be used to monitor and track shipped products, ensuring that users only receive the correct product. The project's main goal was to increase transparency about the product during customer purchases and make it easier for customers to determine whether the product they were purchasing was original or counterfeit. In this proposed system, we use Blockchain Technology to detect fake products. The first step is to connect all manufacturers to the blockchain network and collect their key product data. Product verification is done by registering and providing the correct ID and password. The product will mostly remain the property of the manufacturer. The manufacturer will request that the product be added to the network and provide a QR code for the product. If the product and manufacturer are approved, the regulator will register online. Integrating blockchain technology into product lifecycle management is a new way to ensure transparency, efficiency and security across the business. Since the entire product journey is recorded on the blockchain, the system can easily track the source of the

product by creating QR codes for the products. It provides products with an immutable history from the moment the seller delivers the product until the buyer receives it using blockchain technology.

Advantages: High Security, More Strong, More Efficient. It is easy to control. The system is user friendly. Provides security by providing real information to customers.

5. SYSTEM DESCRIPTION

This system has two main modules and their submodules.

5.1 Administrator

Login: The administrator can log in using the username and password.

Manage Items: Administrators can add, edit, delete and view items. They can add all information about the product including, Product number, Date of production, Country of product, Expiration date and more. They can add information about the product who sells this product sales person.

Fake Login: Administrators can view fake logins.

5.2 User

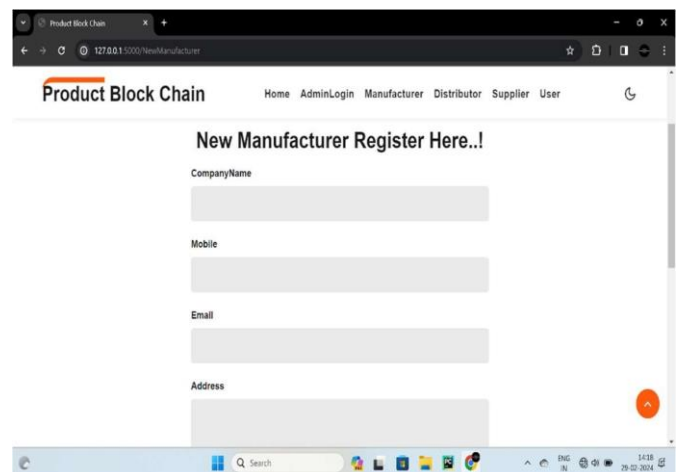
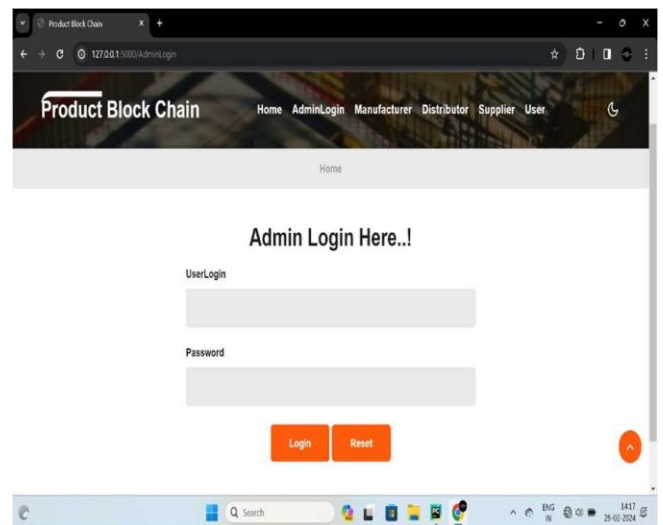
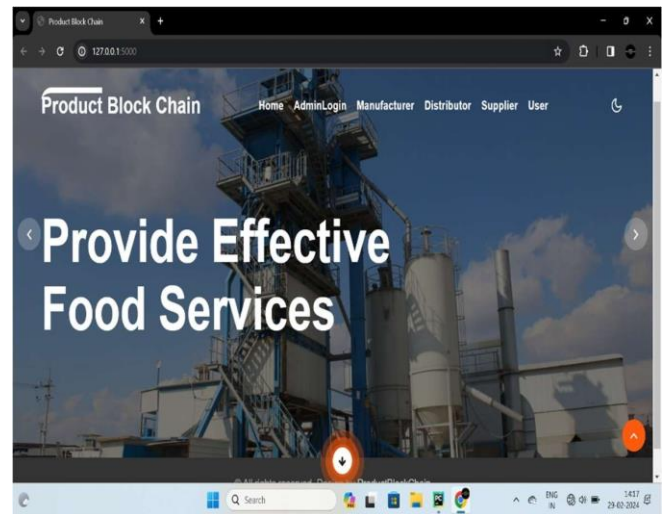
Registration : Users must first register to enter the system.

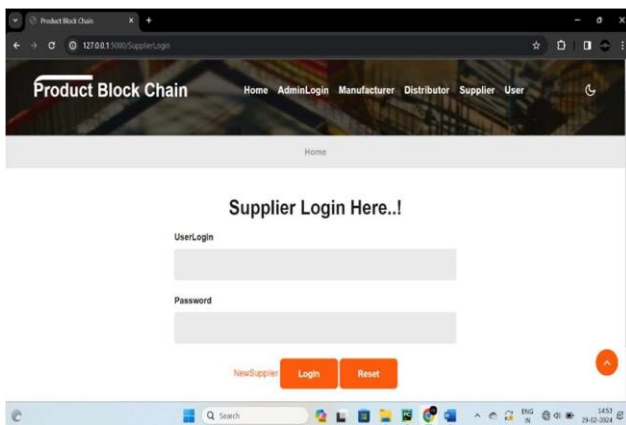
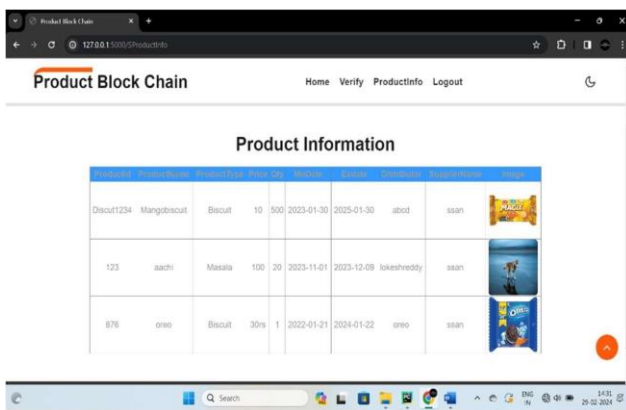
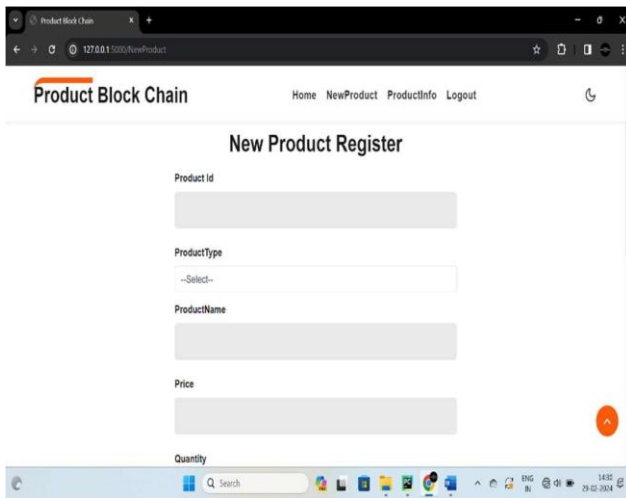
Login : Users can log in using their username and password.

Change Password : Users can change their password according to their preferences.

Scan the product : User needs to scan the barcode of the product. If the item is visible then the user will be able to see all the details of the same item. If the scanned barcode is fake, it informs the user that the product is fake. If the product is not found, the user can send the product image containing detailed information to the administrator as a fake product entry.

6. OUTPUT





7. SYSTEM ARCHITECTURE

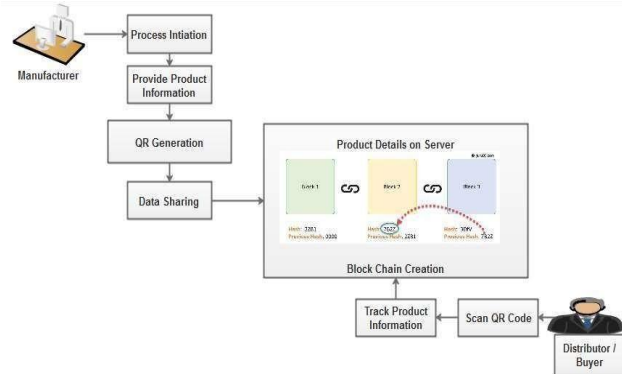


Fig -2: System Architecture

7.1 Application

The system aims to protect market value and prevent the threat of fraud by using blockchain technology.

7.2 Software components

- Operating System : Windows OS
- Front End : Python
- Back End : SQL Server
- Application : Web Application
- Tool : Visual Studio 2010

7.3 Hardware components

- Processor : Intel Pentium Processor
- RAM : 4 GB
- Hard disk : 160 GB
- Compact Disk : 650 GB
- Keyboard : Standard Keyboard
- Monitor : 15 inch color monitor

CONCLUSION

In summary, the use of blockchain technology and QR codes can be a good solution to prevent fraud for many businesses. Using blockchain-based technology, the entire chain can be monitored and the authenticity of the product can be verified. QR codes can be used to store important information about products such as country of origin, production date and other details. By scanning the QR code, customers can access this information and verify the authenticity of the product. Additionally, technology standard and data storage and access process should also be required. The cost of the technology should also be taken into account.

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