

QR WITH BLOCKCHAIN BASED COUNTERFEIT PRODUCT IDENTIFICATION

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Abstract:

Product tracking using blockchain technology involves creating a tamper-proof and immutable record of a product's journey from its creation to its delivery. This can be achieved by creating a digital ledger that records every step of the product's journey, from its origins to the point of sale. Using blockchain technology for product tracking can provide a number of benefits, including increased transparency and accountability, reduced fraud, and improved efficiency. The use of blockchain technology can help prevent the production and distribution of counterfeit products by creating a secure and transparent supply chain. One of the key features of blockchain technology is its ability to create a decentralized ledger of all transactions that occur within a given network. Each transaction is verified by a network of nodes, making it nearly impossible to tamper with or manipulate the data stored on the blockchain. By using blockchain technology, manufacturers and distributors can track every step in the supply chain, from the sourcing of raw materials to the delivery of finished products to consumers. This can help ensure that every product is authentic and has not been altered or replaced with a counterfeit. In this application provides a blockchain-based solution for combating counterfeit products is the use of unique digital identities, or "cryptographic hashes," for each product. These hashes are recorded on the blockchain, allowing anyone to verify the authenticity of a product by scanning its barcode or

QR code. The digital identity can also include information about the product's origin, manufacturing history, and other relevant details.

I. INTRODUCTION

1.1 OVERVIEW

In today's increasingly globalized marketplace, the pervasive issue of counterfeit products represents a formidable challenge that affects consumers, manufacturers, and brand integrity on a global scale. The infiltration of counterfeit goods into the supply chain not only compromises product quality and safety but also engenders substantial economic losses and undermines consumer trust. To address this multifaceted dilemma and ensure the authenticity of products, this project introduces a ground breaking solution: a QR code-based product verification system intricately integrated with the revolutionary blockchain technology. By uniting the convenience of QR codes with the security of blockchain, this initiative aims to redefine the landscape of counterfeit product detection, ushering in an era of enhanced transparency, trust, and security across the supply chain. This endeavor endeavors to combat the persistent challenge of counterfeit products head-on, forging a path towards secure and reliable consumption and the preservation of brand integrity

1.2 BLOCKCHAIN TECHNOLOGY

Blockchain builds on the idea of P2P networks and provides a universal data set that every actor can trust, even though they might not know or trust each other. It provides a shared and trusted ledger of transactions, where immutable and encrypted copies of information are stored on every node in the network. Economic incentives in the form of native network tokens are applied to make the network fault tolerant, and attack and collusion resistant.

1.3 FEATURES OF BLOCKCHAIN TECHNOLOGY

Better Transparency : Transparency is one of the big issues in the current industry. To improve transparency, organizations have tried to implement more rules and regulations. But there is one thing that doesn't make any system 100% transparency, i.e., centralization.

Enhanced Security : Blockchain technology utilizes advanced security compared to other platforms or record-keeping systems. Any transaction that is ever recorded needs to be agreed upon according to the consensus method. Also, each transaction is encrypted and has a proper link to the old transaction using a hashing method.

II . LITERATURE SURVEY

Title: Using Blockchain and Smart Contract for Traceability in Agricultural Products Supply Chain

Description : Propose a method to efficiently execute agricultural products transaction by using consortium blockchain and smart contract, so as to track agricultural products in the whole supply chain. The traditional traceability system usually uses data collaborative management to realize the traceability process.

The data of each enterprise is independent in the local central database. The affiliated enterprises need to establish a connection between the data of adjacent

enterprises in the supply chain. On the other hand, they are responsible for data management. When scanning bar code or two-dimensional code, the traceability information is traced backward through the data connection among enterprises, and then the traceability information is displayed forward to realize product traceability.

Advantage :

Useful for agricultural products

Disadvantage :
Does not consider other products

Title: Intelligent Monitoring Systems for Transportation of Perishable Products based Internet of Things (IoT) Technology

Description : Implement a cost effective way to enable real-time food tracking and monitoring. Due to wide range of refrigerated-equipped vehicle movements and also some of them are in the exposure of adverse atmospheric environments, their transporting process management will be difficult. This system is designed as modular and is composed of temperature and humidity module, monitoring automatically gate switch module, RFID module, monitoring refrigerator equipped vehicle module, GPS/GPRS module. WLAN, remote monitoring center, etc. The system is attempted to achieve the objectives of real-time monitoring with high precision based on advanced network technologies and integrating existing technologies.

Advantage :

Works on food products

Disadvantage :

Depends on IOT, which might little inefficient

Title: A blockchain-based technological solution to ensure data transparency of the wood supply chain

Description : Designs a traceability system based on blockchain technology for storage and query of product information in supply chain of agricultural products. Leveraging the characteristics of

decentralization, tamper-proof and traceability of blockchain technology, the transparency and credibility of traceability information increased. A dual storage structure of “database + blockchain” on-chain and off-chain traceability information is constructed to reduce load pressure of the chain and realize efficient information query. Blockchain technology combined with cryptography is proposed to realize the safe sharing of private information in the blockchain network. In addition, we design a reputation-based smart contract to incentivize network nodes to upload traceability data.

Advantage :

Useful for fruits and vegetable

Disadvantage :

Does not consider other product's

III. SYSTEM ANALYSIS

EXISTING SYSTEM : The existing system in a product supply chain process typically involves a series of traditional and often manual practices that have been in place for many years. These processes can vary depending on the specific industry, organization, and region, but they often share common characteristics. In many supply chain processes, documentation is predominantly paper-based or relies on digital formats that are not interconnected. This includes invoices, purchase orders, bills of lading, and other critical records. The manual handling of these documents can lead to errors, delays, and increased operational costs.

Disadvantages :

- 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.

- This can lead to delays in product development and distribution. 14

- Existing systems are more susceptible to counterfeit products entering the market, which can damage brand reputation and customer trust.

PROPOSED SYSTEM : Blockchain technology can also enable real-time tracking of products as they move through the supply chain, providing manufacturers and distributors with greater visibility and control over their inventory. This can help them quickly identify any suspicious activity or anomalies in the supply chain, such as unexpected delays or diversions. In addition, the use of smart contracts on the blockchain can help ensure that all parties involved in the supply chain adhere to certain rules and standards, such as quality control measures or ethical sourcing practices. Smart contracts can automate the verification and enforcement of these rules, reducing the risk of human error or fraudulent activity. The decentralized and transparent nature of blockchain makes it an ideal tool for creating a reliable and trustworthy system for tracking products. Each time a product changes hands, the transaction can be recorded on the blockchain, creating an unalterable record of the product's journey.

Advantages :

- 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. • This can lead to delays in product development and distribution.

IV. APPLICATION OF BLOCKCHAIN

1. Asset Management :

Blockchain plays a big part in the financial world and it is no different in asset management. In general terms, asset management involves the

handling and exchange of different assets that an individual may own such as fixed income, real estate, equity, mutual funds, commodities, and other alternative investments.

2. Cross-Border Payments :

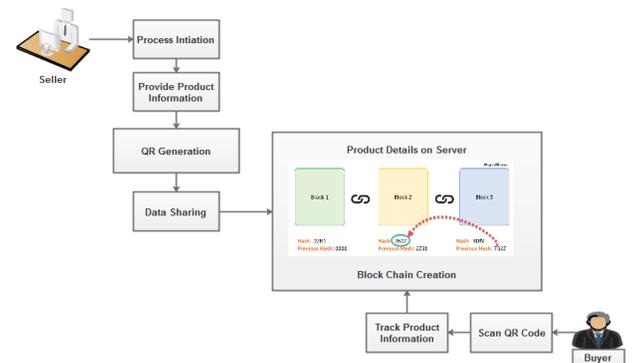
Have you ever tried to make cross-border payments in different currencies from one country to another? This can be a long complicated process and it can take many days for the money to arrive at its destination.

3. Healthcare :

Blockchain can have a big impact on healthcare using smart contracts. These smart contracts mean that a contract is made between 2 parties without needing any intermediary. All the parties involved in the contract know the contract details and the contract is implemented automatically when the contract conditions are met.

V.SYSTEM ARCHITECTURE

System architecture involves the high level structure of software system abstraction, by using decomposition and composition, with architectural style and quality attributes. A software architecture design must conform to the major functionality and performance requirements of the system, as well as satisfy the non-functional requirements such as reliability, scalability, portability, and availability. System architecture must describe its group of components, their connections, interactions among them and deployment configuration of all components.



System Architecture

VI . MODULE DESCRIPTION

- Product Supply Chain Creation
- Provide Product Information
- QR Generation
- Buyer Credentials
- Track Product Information

6.1 Product Supply Chain Creation

In this module, seller provides the product details such as product name, id, validity details and so on. These details are binds it with a unique hash code. The details of the products along with the hash code are stored on the blockchain. The information added by the seller gets stored on the blockchain, providing transparency to the supply chain to other stakeholders. Once information is added to the blockchain, a hash ID is produced that can be used for tracking the transactions.

6.2 QR Generation

QR Code technology can be used to create unique identification of each product, which can automatically enforce rules and regulations throughout the product's journey. QR codes can be used to provide more information about a product. Buyers can ensure if the product they are buying is

safe or not based on QR code. Buyers can extract the information from QR code. QR code could be generated at any point in the supply chain, and it holds the information passed in the block. This id is used to know the details about product validity details.

VII. CONCLUSION

In conclusion, the use of blockchain technology and QR codes can be an effective solution to avoid counterfeit products in various industries. By using a blockchain-based system, it is possible to track the entire supply chain and ensure the authenticity of a product. QR codes can be used to store important information about the product, such as its origin, manufacturing date, and other details. By scanning the QR code, consumers can access this information and verify the authenticity of the product. In addition, there is a need for standardization of the technology and the way the information is stored and accessed. The cost of implementing this technology also needs to be considered.

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