Fake Product Identification using Block Chain

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ABSTRACT

In recent years, Counterfeit products play an important role in product manufacturing industries. This affects the companies name, sales, and profit of the companies. Blockchain technology is used to identification of real products and detects fake products. Blockchain technology is the distributed, decentralized, and digital ledger that stores transactional information in the form of blocks in many databases which is connected with the chains. Blockchain technology is secure technology therefore any block cannot be changed or hacked. By using Blockchain technology, customers or users do not need to rely on third-party users for confirmation of product safety. In this project, with emerging trends in mobile and wireless technology, Quick Response (QR) codes provide a robust technique to fight the practice of counterfeiting the products. counterfeit products are detected using a QR code scanner, where a QR code of the product is linked to a Blockchain. So this system may be used to store product details and generated unique code of that product as blocks in the database. It collects the unique code from the user and compares the code against entries in the Blockchain database. If the code matches, it will give a notification to the customer, otherwise it will give the notification to the customer that the product is fake.

Keywords: Counterfeit product, QR code, Blockchain.

I. INTRODUCTION

The global development of a product or technology always comes with risk factors such as counterfeiting and duplication, which can affect the company's name, company revenue, and customer health. There are so many products that exist in the supply chain. To ensure that the product is real or fake. Because of counterfeit or fake products manufacturers facing the biggest problem and huge losses. To find the genuineness of the product we can use blockchain technology. Blockchain is an arrangement of recording information that makes it troublesome or hard to change, hack, or cheat the framework. A blockchain is essentially a computerized record of transactions that is duplicated and distributed across the entire network of PC systems on the blockchain. Each block in the chain contains multiple transactions, and every time a new transaction occurs on the blockchain, a record of that transaction is added to every participant's record. The decentralized database managed by the number of participants is known as Distributed Ledger Technology (DLT). Blockchain is a type of DLT in which transactions are recorded with an immutable cryptographic signature called a hash. Blockchain technology helps to solve the problem of counterfeiting a product. Blockchain technology is more secure. Once the product is stored on the network hash code is generated of that product and it is possible to maintain all transaction records of the product and its current owner as a chain will be created for that product transactions. All the transaction records will be stored in the form of blocks in the blockchain. In the proposed system we are assigning a generated QR code to a particular product and the end customer can scan that QR code to get all information about that product. After scanning the QR code we can identify that the product is real or fake.

II.RELATED WORK

1] A Survey of Counterfeit Product Detection by Prabhu Shankar, R. Jayavadivel. Counterfeit products are growing exponentially with the enormous amount of online and black-market. So, there is a strong need to address the challenges of detecting counterfeit products and designing appropriate technology to improve detection accuracy. This is one of the active research areas to be explored in the current world. This paper discusses various techniques for identifying counterfeit products.

2] Smart Tags for Brand protection and anti-counterfeiting in the wine industry by steven, Marko. This paper describes a brand protection and anticounterfeiting solution for the wine industry based on smart tags and Cloudenabled technologies. The main idea behind smart tags is to utilize quick response codes and functional inks supported by the Cloud system and two-way communication between the winemaker and end-user.

3] A Blockchain-based Supply Chain Quality Management Framework by Si Chen, Rui Shi. In this paper, we propose a blockchain-based framework. This framework will provide a theoretical basis for intelligent quality management of the supply chain based on blockchain technology. Furthermore, it provides a foundation to develop theories about information resource management in distributed, virtual organizations.

III.PROPOSED SYSTEM

Nowadays, with the rise of technology and markets the problem to differentiate with original and duplicate has also incurred a lot of damage to consumers, distributors, retailers and also manufacturers. Therefore, in order to combat this a blockchain based application fake product detector is proposed. This chapter briefs the design of the system including a full description of the function and user interface of the system. The goal is used to use the blockchain features to provide a convenient, accurate and low-cost product anti-counterfeiting solution. The system is a blockchain based android application used to detect counterfeit products on daily basis.
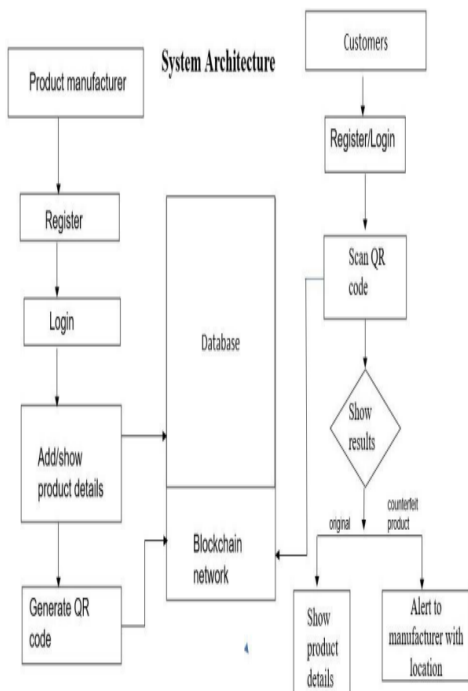
Fig 1: System Architecture

The system consists of manufacturer and consumer part application:

MANUFACTURE END: The company after verification of mail Id for registration and authentication purpose. They can login to the system and add new product/item, upload the product details with system generated QR code which stores all the details of the products. Serializing the QR code is also advised for more security and to keep track of the product. The product details will be stored in database and QR code is made tamper proof using secure graphic technique which makes the QR code copy sensitive that is when copied it loses information and printed irreversibly.

CUSTOMER END: Customer has to register/login with email ID and password. After the completion of user authentication, the product initiates with scan button to scan QR code of the product. Here user is customer who wants to confirm whether the product is legit or not. The unique scanned code from the customer will be compared with the code produced by the manufacturer in blocks. Then the user will be notified with authenticity of the product. There is an option for customers to check product details like name, manufacturing year, price, total quality, quality of the product and also the details of manufacturer.

WORKING: The system will detect counterfeit products using QR (Quick response) code, where QR code is chained to a specific product and linked to smart contracts to scan the code using smart phones or any device that scan. This will notify whether the products are original or fake. A company after verification of mail Id and registration process will be given access to upload the product details with system generated QR code. The product details include brand and product name with manufacturing year, price, total quantity, quality of the product and also the details of manufacturer. This will be stored in database(firebase) and QR code will be stored in decentralized block using Blockchain technology. Each transaction of block will contain a unique QR code which cannot be reused by the manufacturer for different product. Manufacturer can make the tracing and identification process more secure and reliable by making use of serialized QR code with can show product information, engage customers and increase sales. Customer has to register/login to the system before scanning the QR or barcode of the product. After the completion of user authentication, the unique scanned code from the customer will be compared with the code produced by the manufacturer stored in blocks of smart contracts. If code matches, then user will be notified that product is original with all its details and authentic certificate from database.

If code does not match, the user will be notified that product is fake which can prevent purchasing of falsified product and that may result in significant health or financial losses. Even manufacturer can be benefitted if product is fake then the location of the user will be accessed with permission and alert will be sent to manufacturer who can take further legal actions on distributor, retailer and black-market manufacturer. This ensures customers trust on merchants and increases the user's satisfaction and also can save manufacturer time and money

in fighting the defamation and sales because of forged manufacturers.

IV.RESULTS AND DISCUSSION

The results of the project show that how the system work. It uses QR code for authenticating the product originality, if the scan QR code shows the details of the for the product which includes the description, product name, manufacturer name, company name, unique product id, and others then we can say that product is authentic.

If by scanning the product QR code if it does not show any details the we can say that the data for the product does not present in the blockchain system and it has been counterfeited. So, we can say that the product is fake.
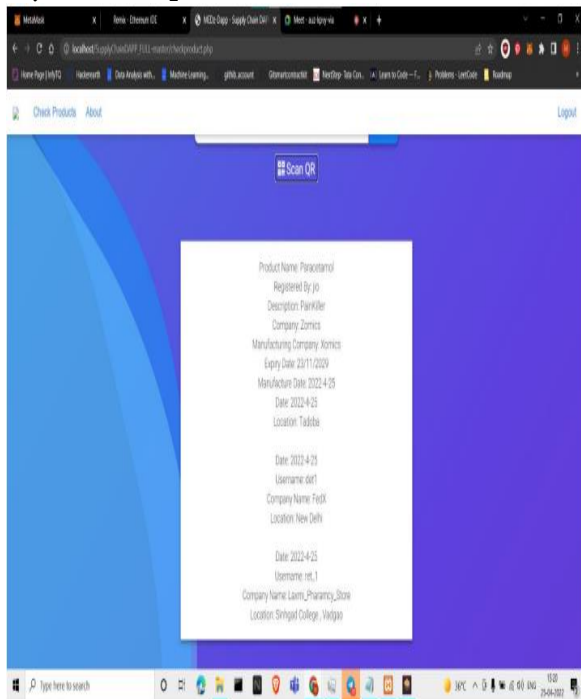

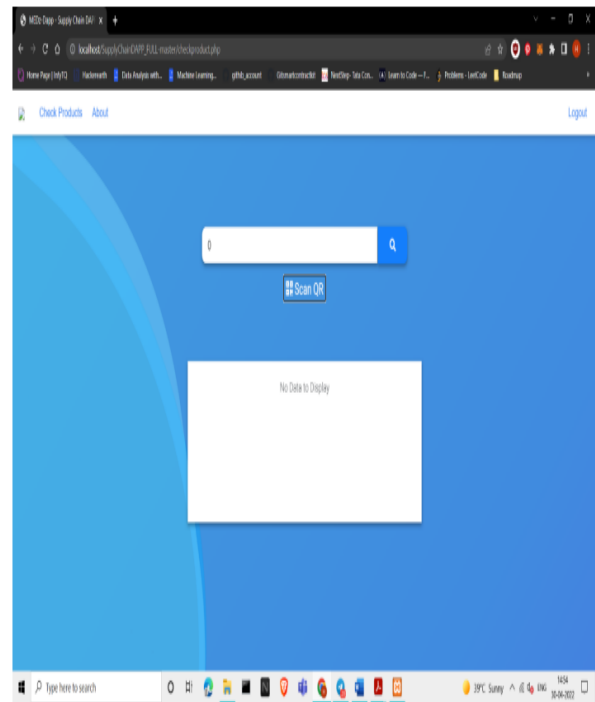**Figure 2: Scanned product shows all details proves authentic.**

Figure 3: Scanned product shows no details proves fake.

II. CONCLUSION

Counterfeiting products are growing exponentially with the enormous amount online. So, there is a strong need to detecting counterfeit products and blockchain technology is used to detect fake products. Furthermore, the information is encoded into a QR code. Customers or users scan the QR code and then they can detect the fake product. Digital information of product can be stored in the form of blocks in blockchain technology. Thus, in this paper we discussed the system and the solution to fight against the malpractices of counterfeiting of the products, and proposed the system which is useful for end user to detect whether the product is fake or not by checking the throughout history of the product in the supply chain. End user can scan QR code assigned to a product and can get all the information that has been put up throughout the supply chain in the blockchain on which end to end user can check whether the product is genuine or not.

III. REFERENCES

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