International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 6 June 2023, pp: 884-890 www.ijaem.net ISSN: 2395-5252

Fake Product Identification Using Blockchain

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Date of Submission: 20-06-2023 Date of Acceptance: 29-06-2023

ABSTRACT—Blockchain technology identifies real product from fake ones. Blockchain is a distributed, decentralized, and digital tally that stores sale related information in the form of blocks in the databases which is connected in chains. Blockchain technology is secure and the blocks cannot be changed or fluently addressed. By using blockchain technology, guests need not calculate on third party services for the safety of the product. In proposed system, we will be using Quick Response(QR) code to give robust fashion to try and stop the practice of counterfeiting the products. Fake products have a massive impact in manufacturing diligence. This is affecting the character of colourful companies, deals, and profit. Fake products can be detected using a Quick Response scanner, where a QR code attached to the product is linked to the Blockchain network. Blockchain can be used to store the data like product details and induce unique code for that product as blocks to the database of Blockchain. When the consumer uploads the unique code, the code is compared to the Blockchain database. If the code matches the code that was generated during the manufacturing process of the product, it'll notify the client saying the QR code is matched, else it'll notify the client that QR code isn't matched and the product is fake.

Keywords – Python, Solidity, Flask, Contracts.

I. INTRODUCTION

Threat concerns like product counterfeiting can damage a company's reputation, notoriety, and overall growth as a result of the creation of a product or any technology. The difficult task at hand is to distinguish fraudulent products from genuine ones. If the counterfeiting occurs in the medical industry, lives could be at risk. Products like garments and electrical equipment that are counterfeited can harm a company's brand value. By 2026, e-commerce is expected to increase from $40 billion to $220 billion.These E-commerce websites started operating on mobile devices, which caused the surge. The profitable growth may be hampered by an increase in fraudulent goods. After doing many tests, the data shows a rise in bogus.

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Both the makers and the customers suffer severe losses as a result of counterfeiting. To determine whether a product is fictional, we can employ Blockchain technology(1). The term "fake" refers to the replication of an item that is actually real with the intention of robbing, destroying, or modifying the real, for use in unethical transactions, or in any other way to lead people to believe that the false composition has an equal or higher value than the real composition. Products that are illegally or subtly copied from the original are referred to as fakes. Fake products are continuously produced with the aim of gaining from the higher value of the imitated goods.

The term "fake" is frequently used to refer to counterfeits of official documents and plutocrats' money, as well as copies of goods like jewellery, handbags, shoes, cosmetics, medicines, unlicensed aircraft corridors (which have been to blame for

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numerous accidents), watches, electronics (both raw materials and finished products), software, workshops of art, toys, and pictures. Changing or modifying the frame in which the information is recorded requires extreme care. A blockchain is a distributed network of technologies that maintains an automated record of all transactions.

When deals are being made, a typeof cryptographic hand known as a hash address is created(3). Blockchain technology can be used to curb product counterfeiting. This system is genuinely safe. The system has four crucial effects: the sale record, the product owner, the public, and the possibility of record revision. As the network streamlines the information about the product, a hash address is created for the product that may be used to track transactional information about the product and information about the current power. As the products are continuously transferred from the manufacturer to the distributor and from the distributor to the client, blocks are produced.

The QR code is produced using the hash address and then added to the item. The client receives information about the goods straight from the point of manufacture when he scans the QR code. The client receives notification of whether the goods is genuine or a fake as they scan the QR canons(4). To record the product's power within the Blockchain network, we intend to implement a Blockchain system armature.

1.1 PROBLEMDEFINATION

Product authenticity is crucial for preventing counterfeiting. Unfortunately, requests, other product distribution centres, and shopping promenades all sell identical goods. Sometimes retailers willfully sell fraudulent goods to make large profits. The tricky aspect therefore is determining whether the goods is authentic or phoney. Hearing this passing with drugs and sprat's toys is just ominous. As the products' value is questioned, the problem is becoming more serious. The product is not only evaluated based on its physical attributes; it can also be traded in a virtual environment, and its past may be examined. The relationship between the customer and the shop or business may be impacted by this. The trade in the original region can be impacted.

1.2 EXISTINGSYSTEM

The blockchain technology is home to many counterfeit goods. Distributors utilise supply chain graphs as a tool to detect big quantities of fake goods. The shipping path of the vessel in the company's force chain logistics can be seen by distributors using force chain graphs. Distributors utilise various force chain graphs in different ways to trace shipping routes all over the world. Since approximately eight times ago, this has been a standard of assiduity. The issue with the current system is that verification is only done in bulk, and there is no reliable mechanism for the final customer to confirm the product's legitimacy.

1.3 PROPOSEDSYSTEM

The suggested solution will maintain the product's power history as well as its blockchain journey. so that when customers purchase this product, they may read all available information about it and determine whether it is legitimate. In order to verify the products and add information about them, we will employ QR codes. Blockchain technology can be used to create a system for keeping product data that prevents anyone from altering the data in any way. Therefore, in the suggested system, we would descrybogusproductsusing blockchain and QR canons.

II. LITERATURESURVEY

The paragraphs provided discuss various research anddevelopment efforts aimed at fake product identification using blockchain.

One project described in [1] focuses on Blockchain technology, it has been used extensively to ensure high data trustability and security, from the operation of Bitcoin to BaaS (Blockchain as a Service), a cutting-edge blockchain model that functions as a form of pall-based community for organisations that expand blockchain-based apps. Significant apps outperformed the use of the blockchain, which is increasing popularity.

In [2],The blockchain technology that underpins cryptocurrencies like Bitcoin and others has gradually gained attention in recent years due to their popularity. Following the approved launch of Facebook's cryptocurrency project Libra and the release of the Libra white paper, Libra sparked extensive discussions across the globe. The public's awareness of open finance has increased under Libra, and the traditional financial system is being significantly affected. Through a comparative analysis of Libra, Bitcoin, and Ethereum, we fully evaluate and discuss blockchain technologyin this article and highlight Libra's innovations in agreement algorithm, performance, and operation script. Finally, we present the difficulties that Libra willrun into in the future.

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Another project, presented in [3],Current anti-counterfeiting force chains plan tofight bogus goods from a centralised location. Similar problems to single point processing, storeroom problems, and failures are caused by this armature. Blockchain technology has emerged as a potential solution for problems of this nature. In this work, we propose the block- supply-chain, a novel decentralised force chain that utilises blockchain and Near Field Communication(NFC) technologies to identify counterfeiting attempts.

In [4], The Advertisements- B signal isn't translated in any way, and conventional receivers can't verify its veracity. This implied danger to aviation safety arises from the Advertisements- B signal's lack of translation and validity. This research suggests a four-station unresistantmultilaterationAdvertisements- Banti-counterfeiting system based on TDOA in light of the instability of Advertisements- B. Each station's timepiece is attended by a reference station, and TDOA equations are solved using the Chan Algorithm. The system has been set up and put through its paces with a number of breakouts close to Beijing Capital International Airport. To achieve the goals of Advertisements-Banti-counterfeiting and mock signals localisation, the system may follow an airplane's journey in real time and compare it with the positions claimed by Advertisements-B dispatches.

In [5],The implied helpful functions of this technology have thus been greatly exaggerated. In order to focus on the architectural aspects of the Bitcoin cryptocurrency in isolation, this paper avoids the debate over what makes a blockchain similar. We believe that resolving common issues is crucial to designing efficient 8 force chain operating systems. We suggest a solution for each related issue that makes use of one or more fundamental Bitcoin features. This leads to the development of five design principles for improved force chain operating systems through the use of data structures and incitement mechanisms inherent to the Bitcoin cryptocurrency protocol.

In [6], Micro-character is a highly ingrained system in the field of counterfeit prevention. The graphic information processing and printing reproducing technology is highly demanded by this system and is employed in securities and bills. This system conceals the halftone micro-character information in the carrier image in accordance with the requirements of publishing technology to achieve the effects of anticounterfeiting and information caching as well as cultural performance. The retiring effect of information, in particular, the structural characteristics of square Chinese characters, advance advanced conditions for the completion of this system, is a significant factor reflecting the position of this technology.

In [7], The blockchain paradigm has proven its worth in a number of systems, including Bitcoin, when combined with cryptographically secured transactions. Each such design can be viewed as a straightforward operation on a single, decentralised cypher resource. This paradigm can be referred to as a transactional singleton machine with participated-state. Ethereum utilises this paradigm in a broad sense. Similarly, it gives a variety of buckets that are identical to one another, each with its own state and operating law but suited for interacting with others through a communication-passing frame. We discuss its layout, crime problems, opportunities it presents, and imagined future obstacles.

In [8], Each item is contained within a container. It is possible to trace these holders from the manufacturer to the distributor. A graph depicting the vessel's journey through the supply chain can be used to help the distributor confirm that the vessel actually came from the manufacturer.

In [9], The health, safety, and quality of life of people are directly or indirectly threatened by China's escalating food safety issue. Politics, society, and global thriftiness all have less of an impact. Many nations and areas have investigated, developed, and used the traceability system as a reliable method of operating and controlling product quality and safety. On the one hand, these technologies weren't suited to achieving more precise traceability, therefore the results couldn't be applied to Chinese requests directly. Thus, the composition presents the idea of blockchain technology, outlines how it works in the food supply chain's information security, and contrasts it with the established force chain method.

Lastly, [10] discusses about the Internet's explosive expansion revealed much about our nocturnal indoctrination. E-commerce is one of the sectors that is growing with a real fire. Online stores typically provide a platform for customers to rate their services. These reviews' veracity might be consulted as a source of data. For example, businesses can use it to express design ideas about

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their goods or services, while implicit users might use it to decide whether to purchase or use a product outright. Unfortunately, some people have attempted to create phoney reviews in order to either increase the fashionability or discredit the product, misusing the significance of the review in the process.

III. DESIGN METHODOLOGY

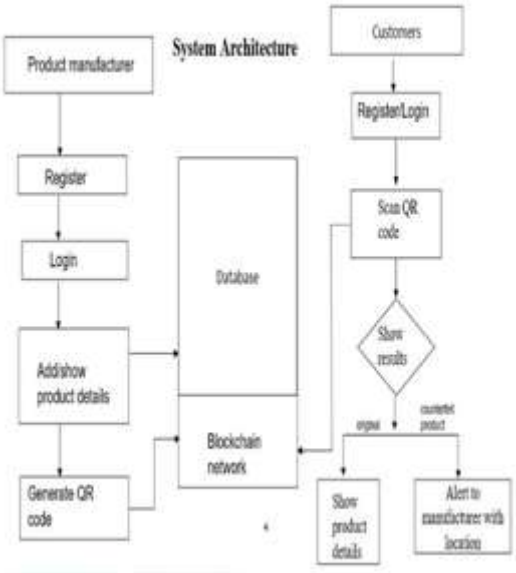

Figure 3.1:Blockdiagramoffake product identification using blockchain

The system that is used to identify bogus products is shown in Figure3.1. A monthly ID that corresponds to the physical products can be registered by the Product Director by registering them in the operation. By entering the monthly ID or scanning the QR code on the product, the customer can determine whether the item they purchased is lawful. Database Information about this product will be saved using blockchain. enact the QR law For each product, the specific QR law will be induced by this block. ignore module This module will support the product while also surveying QR legislation. Add product information This module will assist in introducing new products and removing existing ones.

IV. IMPLEMENTATION

To prevent the sale of fake goods, we are converting all product information from QR codes into digital signatures. These digital signatures will be stored in the Blockchain garçon, which supports tamper-evident data storage. If by chance its data is altered, verification will fail at a future block storehouse, and the stoner may receive information about the alteration. Each piece of data in a blockchain is verified using existing hash functions, and if those functions don't change, the data is considered to be original and unaltered. New sale data is also added to the blockchain as a new block. Each additional data storage facility will prove the validity of the block hash code.

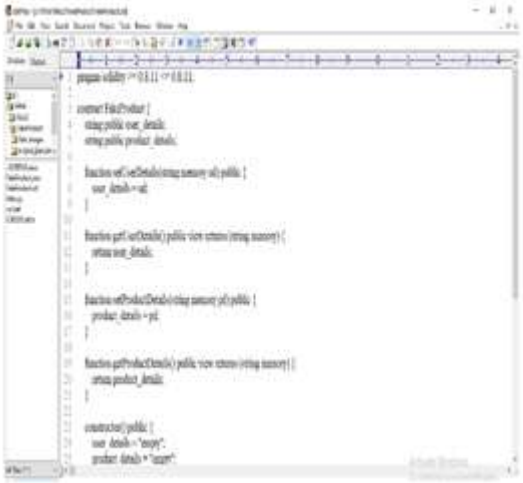

Figure 4.1: Solidity Contractfor checking and retrieving QR codes

Figure 4.1 shows code to store and authenticate Product details we are using Blockchain Ethereum tool and this tool can store and retrieve data using SOLIDITY programming contract code.

Figure 4.2: Python code to access contract

Figure 4.2 shows Python code to access contract, red colour comments shows how we are using contract address to store and retrieve user and product details from Ethereum Blockchain.

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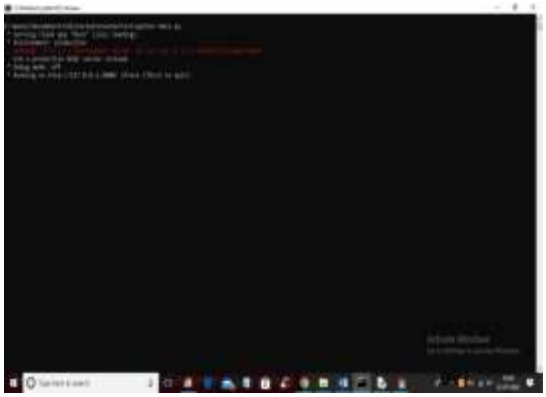

Figure 4.3: Running Flask Server

Figure 4.3 shows the FLASK server and the frontend of the website being started producing a port through which the application can be accessed.

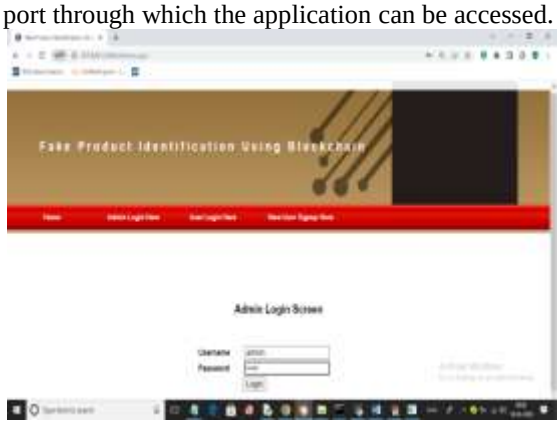

Figure 4.4: Admin Login Page

Figure 4.4 shows Admin Login Page to login admin by entering username and password to access admin features.

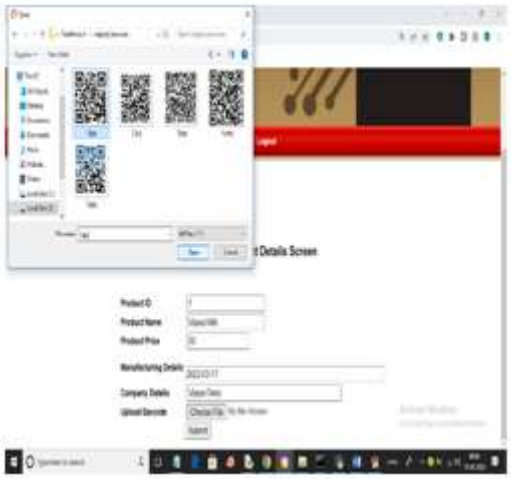

Figure 4.5: Add Product page

Figure 4.5 shows add product module to add new product to blockchain by entering the product ID, product name, price, Manufacturing details, Company details and upload QRcode. Submit the details.

Figure 4.6: Add Product page

Figure 4.6 shows a product being added by the manufacturer and its generated signature stored in Blockchain.

Figure 4.7: User Login Page

Figure 4.14 shows User login page to access the Authentication of product.

V. RESULTS

To verify the originality of product first, user as to login to application and upload the QR code of the Product.

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Figure 5.1: User Page.

Figure 5.1 shows User page, where product data can retrieve and upload the QR-code to verify the product whether it is original or fake.

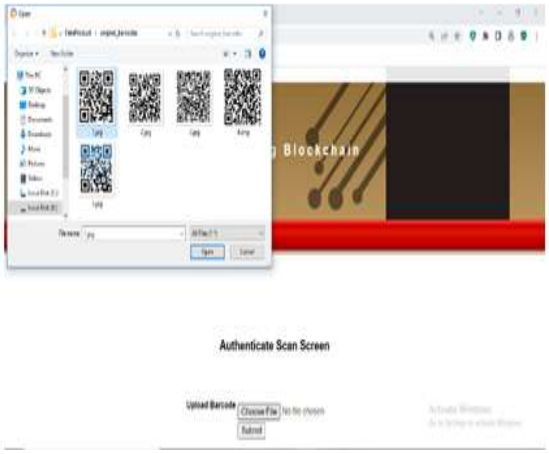

Figure 5.2: Authenticator Scan Page

Figure 5.2 shows 'Authenticate Scan' link which allow user to upload Product QR-code and then application will generate Digital Signature and verify with Blockchain signature and if signatures valid then will get product details else authentication get failed.

Figure 5.3: Result of Authenticator Scan Page

Figure 5.3 illustrates the results after uploading the original QR-code into the system and shows the QR-code authenticated and we got all details from Blockchain.

Now upload Fake Barcode to check.

Figure 5.4: Authenticate Scan Page (uploading fake QR-code)

Figure 5.4 shows an example of submitting a different (fake) QR code to the blockchain system without the admin's permission.

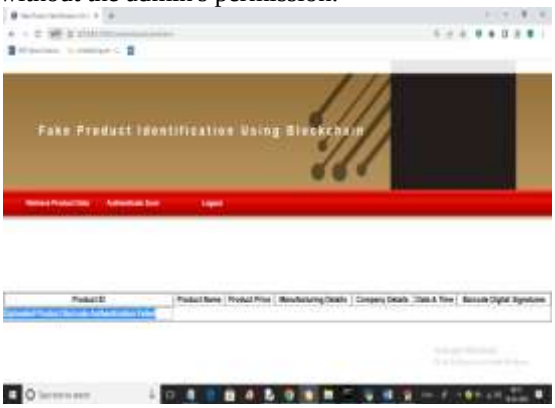

Figure 5.5: Result of Authenticator Scan Page

Figure 5.5 demonstrates the result after uploading the another(fake) QR-code to blockchain system where the digital signature donot matched and shows that upload of the product authentication was Failed.

VI. CONCLUSION

The major goal of this design was to illustrate how to use blockchain for false product identification in order to reduce the incidence of people being duped into thinking that a phoney goods is an authentic. In conclusion, the suggested system verifies the product's validity with the help of the producer and the blockchain technology, which enables the storage of the product's specifics. The security provided by the proposed system,

made possible by blockchain, is also one of its key advantages. The details of each knot are saved in every other knot, making it nearly impossible to access the blockchain and preventing the bumps from being changed.

VII. FUTURE SCOPE:

- Verifying whether a specific knot is a part of the block requires a lot of time from the blockchain. The length of time required to add a new knot is advanced because every block in the blockchain needs to be optimized for every new knot added. O(2n) is the complexity factor. This time efficiency is excellent and may be significantly improved without sacrificing the security provided by the blockchain.
- The QR code has to be improved upon because it can be damaged. Try to find a way to get around the restriction by adding some substance to the item so that when someone tries to grab the QR code, a signal is sent out warning that the QR code has been tampered with and that its legitimacy has been called into question.

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